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All communications to be addressed:

"The Editor, Journal of Agriculture, Victoria Square, Adelaide"

POINTS FOR PRODUCERS.

Agricultural Bureau Congress.

Preliminary arrangements in connection with the twenty-ninth Annual Congress of the Agricultural Bureau are under way, and Branches have already submitted a large number of questions and subjects for consideration. It is usual for the Congress to be held during the same week in which the Royal Agricultural and Horticultural Society's Show is held, and there is little likelihood of any alteration this year.

Upper Eyre's Peninsula.

Representatives of the Branches of the Agricultural Bureau situated in the Upper Eyre's Peninsula District will meet in Conference at Cowell on Thursday, August 8th. The Conference will extend over three sessions, which commence at 10 a.m., 2 p.m., and 7.30 p.m. respectively. Local arrangements for this gathering are in the hands of the Salt Creek Branch.

Notes on Devon Cattle.

Devons are represented by North and South Devons. The North are the original Devon Reds, with their home on the moorlands of the county. They are unsurpassed for compactness and symmetry—heavy weights in small parcels. Allied to the Sussex and Herefords, their cousinship with the latter (says the Veterinary Lecturer) is sometimes shown by a white underline, and if they were horses would be celebrated for their blood. Full of quality, hardiness, and early to mature, the breed has remained pure from Phœnician days, and consistently won in beef classes against all comers all over the world; hence they are looked on as essentially beef beasts, but the dairies of Devon and Somerset are stocked with cows that keep up their 1,000galls. a season, and as milkers they are by no means in second rank, their short lactation being due to their semi-wild life on the moors, with their calves to be reared as early maturity beef. Two pounds of butter a day is a common performance, and after the fourth or fifth calf they will fatten ripe for the butcher within a month of drying off. The Somerset type, bred in the richer pastures of the county, are larger than the true North Devons, but equally symmetrical; as milkers they are superior. South Devon or South Hams cattle are the result of a fixed type early formed by crossing the red Devon with the Guernsey, and have bred true to type for nearly 300 years. Larger frames, lighter color, longer lactation, are the characteristics; equally hardy, just as quick to fatten—no breed could be better suited to Australian needs. They are going in fast increasing numbers to South America, South Africa, and elsewhere. Their price is steadily rising, and bulls fetched £300 at a recent Totness sale.

Sows Eating Young.

Indigestion and nervousness are the two main causes of sows eating young. No breed as a breed is more prone to this vice than another. Quiet farrowing pens with safety creeps for the piglets (says the Veterinary Lecturer) will suffice to prevent the trouble, especially if during pregnancy the sows have weekly dose of 2ozs. Epsom salts and regular access to charcoal. A sow prone to the vice will not be a profitable breeder, but young sows may do it at first litter and not again.

Imports and Exports of Fruits, Plants, Etc.

During the month of May, 1918, 6,880bush. of bananas, 117bush. of pineapples, 431bush. of passion fruit, 5,926bush. of fresh fruit, 17,456 bags of potatoes, 1,496 bags of onions, 125pkgs. of plants, bulbs, &c., and 1,143 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910. Of these, 20bush. of bananas (overripe) and 27 bags of potatoes (diseased) were destroyed; 325 bags of potatoes were reconsigned out of the State on account of the presence of disease, and 5pkgs. of trees and 51 empty wine casks were fumigated. Under the Federal Commerce Act, 650pkgs. of fresh fruit, 10,547pkgs. of dried fruit, and 1,159pkgs. of honey were exported to oversea markets. These were consigned as follows:—For London, 5,713pkgs. of dried fruit and 1,159pkgs. of honey; for Vancouver, 3,726pkgs. of dried fruit; for New Zealand, 650pkgs. of fresh fruit and 1,108pkgs. of dried fruit. Under the Federal Quarantine Act, 768pkgs. of plants, seeds, &c., were examined and admitted from oversea sources.

During the month of June, 1918, 10,397bush. of bananas, 573bush. of pineapples, 181bush. of passion fruit, 3,821bush. of fresh fruit, 22,967 bags of potatoes, 315 bags of onions, 228pkgs. of plants, bulbs, etc., and 1,270 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910. Of these, 8bush. of bananas (overripe), 1 case each oranges and apples (no fruit fly certificate and codlin moth respectively), and 1pkg. of plants (no phylloxera declaration) were destroyed; 241 bags of potatoes (diseased) were ordered out of the State; 90pkgs. of trees, &c., and 43 empty wine casks were fumigated. Under the Federal Commerce Act, 1,135pkgs. of citrus fruit, 5,791pkgs. of dried fruit, and 4pkgs. of plants were exported to New Zealand. Under the Federal Quarantine Act, 619pkgs. of plants, seeds, &c., were examined and admitted from oversea sources. Of these 7lb. parsnip seed were destroyed and 4pkgs. of plants were fumigated.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

VETERINARY INQUIRIES.

[Replies supplied by Mr. F. E. PLACE, B.V.Sc., M.R.C.V.S., Government Veterinary Lecturer.]

"R. J. J.," Riverton, reports ewes with lambs losing power of hindquarters.

Reply—The trouble with the ewes is parasitic in the blood, known in Spain as roguera. Bleed the affected ones at eye or leg vein, and give a lick to all made of salt 50, lime 30, resin 10, sulphur 10 parts, and I think you will avoid further trouble.

"E. L.," Smoky Bay, reports cows failing to eat food.

Reply—Your cows do not require medicine so much as fresh green fodder such as lucerne, berseem, &c., but failing this let them have access to a lick composed of 50 parts salt, 25 slaked lime, 10 carbonate of iron, 5 phosphate of iron, 5 phosphate of lime, 5 resin.

"H. M. B.," Berri, reports horse with swollen feet.

Reply—The symptoms point to both laminitis (founder) and canker of the sole, which is something worse than greasy heels. As both conditions generally cost more to cure than the horse is worth after, one pleases oneself as to treatment, which may be found in *Journal of Agriculture* under "Laminitis and Canker of Sole."

"P. W. H.," Goode, *via* Murat Bay, has horse suffering with discharge from the nose.

Reply—The symptoms point to disease of the delicate turbinated bones of the nose, producing what is known as nasal gleet or ozaena. It is difficult for an amateur to treat, but if you made a 5 per cent. solution of solyptol and syringed it up the nostril once a day for a fortnight or so you would find an improvement. Have a good look at the teeth as well, as sometimes one of the back teeth is involved.

"H. S. A. B.," Brentwood, reports horse very sluggish, and injury to foot.

Reply—The symptoms described point to injury in the foot, and it would be well to search the foot thoroughly for such, then to poultice for a few days with hot mallows or bran with a little arnica in it. For the sluggishness 10-drop doses of tr. nux vomica would be of use three times a day for a week. I should like to hear what progress the foot makes, as I may have to suggest a change in treatment later.

"G. E. B.," Glynn, asks correct position for branding stock.

Reply—The regulations for branding differ with various kinds of stock, but an application to the Chief Inspector of Stock, Adelaide, will bring you the information you require in the form of a printed leaflet.

"N. J. G.," Yeelanna, reports mare, 12 years old, that turns her head to the flank, and is constantly lying down; also mare with hard swelling between hoof and fetlock.

Reply—Your mare is probably suffering from impaction of the caecum complicated by bloodworms. I would advise giving 15 drops tr. nux vomica three times a day for a week, and following that with arsenical treatment for bloodworms as described in departmental leaflet, obtainable on application. The growth you describe in the joint is probably ringbone, and nothing satisfactory can be done. Various patent remedies professing to cure it will lighten your pocket, but not remove the growth. If you want to treat it apply red biniodide of mercury blister to it at intervals of a month for three months, resting in the meanwhile, but it would probably be better to put on a bar shoe and work her moderately instead.

"H. J. C.," Struan, Naracoorte, reports cow with large swelling extending from jaw to brisket; eats and drinks well.

Reply—The symptoms described are not those of a contagious disease, so that you need not be alarmed on that score. The swelling is most likely dropsical from inflammation of the heart bag, pericardium, caused by a nail or bit of wire that has been swallowed. Chance of recovery is remote, and treatment not likely to be of much good, but if you decide to treat give 10 drops tr. digitalis three times a day alternately with 10 drops tr. arsenicum alb. three times a day.

"F. G. B.," Pinnaroo, reports bull calf unable to stand, and breathes very noisily.

Reply—It is probable that the calf was born slightly before time, and a valve in his heart that should close at birth remained open. He may be dead before now, or may be making a fair recovery, so it is difficult to offer advice; in the latter event he will go on without treatment.

"J. R.," Yeelanna, reports horses with severe strangles.

Reply—I have asked the Department to send you two bulletins, in which you will find full details of treatment of strangles. In the meantime rub in hot lard, and lance when ripe. Wash out cavity with water containing a knob or two of washing soda, and then assist healing by dusting with slaked lime.

"H. S. A. B.," Goode, asks if a bull or steer is subject to dry bible, also the difference in the food value of cocky chaff grown in wet and dry districts, and a remedy for horses suffering with a complaint similar to red water in cattle.

Reply—The diseases belonging to the class called dry bible are due to diet deficiency in vitamines, nitrogenous products very necessary for milk or development of calf, hence cows suffer more frequently than males. The dryness or wetness does not affect the feeding value of cocky chaff, but that grown in dry areas is less digestible than the other. Though a help in dry seasons, it is by no means a first-class food, but is better than straw. Red water is caused by microscopic parasites in the blood, carried by biting flies, and inoculated from one beast to another. It is a rather serious complaint, as it destroys the blood cells. Treatment—A quart of red wine or 2lbs. molasses with 2 tablespoons turpentine or 1lb. lard, followed by a teaspoon of sulphate of iron in food twice daily.

"H. S. A. B.," Penong, reports sheep losing power in the forequarters, sometimes followed by death; also horse, apparently in good health, that staggered and died; and also a horse with a film growing over the eye.

Reply—*Re* sheep, see the April *Journal of Agriculture*, "Some Sheep Worms." You have probably also the bacterial trouble, due to bacillus sporogenes in the good-conditioned ones. One of the licks in the article will act as preventive. Sudden death of horse was due to over distension of stomach, causing stoppage of heart action. Condition of horse's eye is probably due to anaemia of parasitic origin. Give tonic powder, often prescribed in *Journal*, and dress eye with a few drops of solution of silver nitrate, 4grs. to 1oz. distilled water, daily.

"A. A.," Kapinnie, Mount Hope, has cow that sucks herself.

Reply—You may cure the cow of the habit of sucking herself by either of the following methods, the first is better:—Put on headstall and girth and connect two by a wooden rod such as a broom handle; she can graze, but cannot get head round. Put on strap round nosepiece of headstall with projecting spikes which will prick flank and udder, but will not prevent grazing.

"W. E. W.," Mangalo, has young pigs badly infected with lice.

Reply—As frequently referred to in these replies, the pig ticks mentioned in your letter are really lice, the largest of the louse family. It is practically impossible to rid bush sties of them, and it is better, having rid the pigs of them, to house in fresh quarters. Brush or spray the pigs well with a solution of sheep dip or similar disinfectant; a good one is kerosine 1 part to soapy water 10 parts, and oil the pigs well after. Repeat in a week's time till clean.

"A. E. W.," Hog Bay, K.I., reports mare with severe cut on inside hind leg.

Reply—Dust the joint with chlorinated lime 1 part, slaked lime 5 parts, boracic acid 5 parts daily till healing commences, then dress with Stockholm tar once a week. It will probably take many months to really heal.

"W. N., Sen.," Glencoe East, has cows that experience difficulty in passing the afterbirth.

Reply—The trouble described in your letter is partly due to the season, but you will find it a good thing to give a cow after calving 1lb. Epsom salts, 1oz. sulphur, 1oz. ginger in a quart of hot beer. It is also a good thing a week before calving to let them have 20 drops tr. pulsatilla on tongue or in food morning and evening. Do not let the cleaning remain in the cow, but syringe her out with a solution of Condy crystals, as much as will lie on a 6d. bit to a kerosine can of water, 48 hours after calving, and if the drench and this do not shift the cleaning, grease the arm and remove it, as I have often described in *Journal* and lectures.

"M. McP.," Bute, has mare with severe cut in hind leg.

Reply—It will be better not to try and draw the skin together, but to dress the wound twice daily by painting with spirit of iodine; after a week or so of this you will be able to dust with 1 part chloride of lime and 10 parts boric acid, and under favorable circumstances it should be healed in six weeks. Do not bathe it at all.

"A. H. A.," Coomandook, reports mare, due to foal in August, discharging milk from the udder.

Reply—You need not worry about the milk running away, but I would warn you that there is a possibility of her foaling prematurely. Ordinary work will be better for her than spelling. I would suggest 10 drops of tr. pulsatilla each evening, and 10 drops tr. nux vomica each morning for a fortnight or so.

"H. J. J.," Inman Valley, has colt with warts on nose and lips.

Reply—The following treatment generally succeeds in ridding a colt of warts:—Rub the warts one day with vinegar and the next with castor oil, and continue till the warts drop off. If large they may be snipped off with scissors and rubbed with bluestone.

"N. G.," N. Moonta, reports pony with hard swelling on hock.

Reply—I would advise you to mix 1oz. tr. arnica with 1pt. methylated spirit, and use a little on the hock, rubbing it in twice a day.

"W. E. N.," Mypolonga, reports that after driving gelding for about 30 miles the horse refused to eat and attempted to pass water at frequent intervals.

Reply—Spell entirely from work, and feed mostly on bran and crushed oats and green feed, and give 10 drops tr. nux vomica on tongue twice daily for a week.

"B. S.," Hookina, reports pony with large lump on back, and cow with large swelling on the jaw that discharges matter.

Reply—I fear nothing but a surgical operation will remove the lump from the pony's back, but you might try rubbing in a little blue mercurial ointment daily for a fortnight or so to see if it will cause their absorption. The lump on the cow's jaw is very likely actinomycosis, and as this is a contagious disease, you are likely to get into trouble if you do not report it without delay to the Inspector of Stock, Quorn, who will advise you as to whether it is so or not, and as to removal of the lump if not. Do not use her milk till he has seen her, and keep her apart from the other cows.

"Mrs. F. W.," Bordertown, reports pony with injury to the eye.

Reply—The pony's eye has received an injury which has caused it to ulcerate. The light work mentioned will be good for it rather than spelling off. Your treatment so far has been quite right, but I would suggest increasing the strength of

the nitrate of silver solution to 4grs. to 1oz. Apply a few drops daily. Wash the mattery discharge occasionally with cold tea containing a little boracic, and I think in a few weeks time the eye will be practically right again; there may be a permanent speck on the line of injury, but this will probably not interfere very much with the sight.

"A. J. A. K.," Lameroo, has horse unable to put foot to the ground.

Reply—Something penetrated the frog, such as mallee stick; search for it well, and poultice for a few days with hot bran and marshmallow leaves. After this dress daily with Stockholm tar, and if lameness continues, put foot into a bucket of hot water in which a few lumps of bluestone have been dissolved. Give 10 drops tr. arnica on tongue night and morning for a week or so. Bathe swollen leg frequently with hot water in which a handful of washing soda has been dissolved, and give 1oz. Epsom salts twice a day in feed.

"A. H. R.," Mercunda, reports mare in foal with swollen udder.

Reply—There is an abscess in the mare's udder, and it is doubtful whether she will have the use of that half at next foaling, but in the meantime I would recommend you to give her 10 drops tr. belladonna and 10 drops tr. arsenicum evening and morning alternate fortnights till she has foaled, and should the swelling reoccur rub in warm glycerine daily.

"J. L. D.," Milang, asks remedy for young pigs that have lost the use of hindquarters.

Reply—The probable cause of the symptoms is worms, and it is doubtful whether it is good economy to recommend treatment for small pigs; it would be better to cut the loss than fiddle about treating them. If, however, you desire to do so, get the following powder made up—it will be costly—and give a pinch in feed twice daily for a week:—Santonine, 1 drachm; sulphate of iron, 4 drachms; nux vomica, 2 drachms; pomegranate, 4 drachms; charcoal, 4ozs.; chimney soot, 4ozs.; sugar, 4ozs. House warmly and feed as much fresh milk as possible.

"C. E. S.," Galga, has cow that has slipped calf three seasons in succession.

Reply—As the cow slips calf each time it would be better to fatten her off and kill her. As it is quite possible that the abortion is the contagious form, it would be wrong to market her alive.

"V. C. K.," Wirrabara, reports cow unable to stand after giving birth to a dead calf.

Reply—The symptoms point to rupture of the pubic ligament (split aitches), and if you can keep the cow comfortable for some weeks, it is probable she will recover. Should bed sores arise dress them with tr. arnica 1oz., methylated spirit 1pt. Give daily 10 drops tr. arnica on tongue morning and evening for three weeks, and kindly report progress.

"H. S. A. B.," Tarcowie, seeks information for gelding unable to retain water.

Reply—I fear that the condition of the gelding as described can only be cured by a surgical operation, as it is probable that a lithic calculus is the cause of the trouble, but the following treatment might be tried for a month, when I should esteem a further report. Give on the tongue each morning 10 drops tr. cantharides 3x, and each evening 10 drops tr. camph. Feed bran and boiled barley and carrots if obtainable.

"F. D. K.," Watervale, reports cow with sores on udder.

Reply—As you suppose, the affection is cow pox, and treatment should be given as follows:—Boric ointment or carbolic vaseline twice daily after milking, then paint with a collodion made of equal parts castor oil and oak varnish to keep the air off. As a contagious disease isolate affected ones and handle last.

"H. S. A. B.," Ashbourne, seeks remedy for horses that have eaten wheat.

Reply—Horses gorged with wheat and noticed at once should be given ½lb. bicarbonate of soda in a pint of milk, and repeated in an hour if necessary; brisk walking exercise; plenty to drink, and large enemas. If pulse runs up bleed 4qts. at jugular. Horses noticed next morning, same treatment, but 10 drops tr. aconite added hourly, and standing in mud if foundering. See bulletin "The Horse."

"B. Bros.," Koolunga, report gelding with swollen sheath.

Reply—The swelling described is probably lymphatic, and I would advise putting him on bran only for a few days, and giving a teaspoon of saltpetre in it three times a day, also light work or exercise, as possibly bloodworms may be involved in the matter; also it would be well, after reducing the swelling, to give a course of solution of arsenic.

"A. W. C.," Gumeracha, reports draught mare with heavy cough.

Reply—From the symptoms described it is to be feared that the mare is broken winded, *i.e.*, asthmatical, and little of a satisfactory nature can be effected in way of a cure. I would suggest 10 drops of tr. aconite morning and evening for a month, two tablespoons of raw linseed oil in each feed, and the feeds should be little and often, and concentrated—nothing bulky like hay, and nothing dusty or mouldy.

"H. B. K.," Murray Bridge, has cow that calved four weeks ago, but now walks very stiffly.

Reply—The paralysis is closely connected with digestive disturbance, and a quart of red wine morning and evening for a few days will do good, but it would be a good plan to put two tablespoons of syrup of phosphate of iron in it each time. The green barley and lucerne hay are good, but a little bran and crushed oats added would be better.

"F. H. K.," Lyndoch, has heifer very weak across the loins, unable to rise without assistance.

Reply—The paralysis of the heifer's loins is due to changes in the spinal cord; her chances of recovery are not good, but if you will blister her once a month for three times with red mercuric blister 1oz., and give her morning and evening for a fortnight two tablespoons of compound syrup of phosphates she may pay for the trouble.

"F. W.," McLaren Vale, seeks remedy for a cow whose hair is falling out.

Reply—The loss of hair on the cow may be due to lice, very prevalent at this time of year, or it may be a form of eczema, also common just now. Dress the parts with kerosine 1 part, sulphur 1 part, and any cheap oil, such as fish oil-8 parts. Also give 1oz. sulphur in food once daily for a week.

"D. A. B.," Hamley Bridge, reports cow with prolonged retention of afterbirth.

Reply—If your cow is valuable I would advise calling in a private veterinary surgeon without delay, otherwise syringe out the womb with a pink solution of Condy's crystals and warm water once a day as long as there is any discharge, and give an ounce of photographer's hypo once or twice a day in drinking water or feed.

"J. S.," White Hut, Clare, reports calf fed on separator milk and linseed meal suffering with a bad attack of scours.

Reply—It would appear that your calf has dysentery. Stop both separated milk and linseed meal, as possibly the latter is part of the mischief; give whole milk and barley water. Also give a few doses of veterinary chlorodyne one teaspoonful, two or three times a day, and 10 drops of liq. hydrarg. perchlor. with it till well.

AGRICULTURAL INQUIRIES.

[Replies supplied by the Superintendent of Experimental Works (Mr. W. J. Spafford.]

Sorrel.

"O. H.," Parrakie.—Sorrel can certainly be destroyed by cultivation, providing that the land is stirred up every time that the plants make an appearance. Sheep help very considerably in the destruction of this weed, particularly where it is being cultivated to kill it, as they eat the freshly exposed portions, and also the half-dried sections that recover and grow if rain falls before they are properly dried. Sorrel only grows well enough to become a pest in soils containing an excess of acids, and the only way to free a soil of it, or to render it practically harmless, is to counteract this soil acidity. The practical way to do this is by applications of lime or gypsum and frequent cultivation.

SPREADING WEEDS BY MEANS OF SUPER.

"O. H.," Parrakie.—It is possible to introduce weeds in superphosphate, but it is hardly likely to happen to any extent. The bulk of the raw rock phosphate is brought to the State and treated with sulphuric acid and finally "broken down" to the guaranteed analysis by some cheap substance. There are few seeds that would withstand the sulphuric acid treatment and remain alive, so that there is not much danger of introducing weeds to the State while the superphosphate is made here. The material used to break down the phosphate may introduce some weed seeds, but this would only be the means of distributing weeds already present in the State. Many of the weed seeds would adhere to the bags containing the superphosphate if they came into contact with the bags; this would also help to distribute them. In any case the chances are that superphosphate would do no more, and in many cases less, towards the distribution of weeds than other substances moved from district to district.

WEEVIL.

"A. B.," Beetaloo Valley.—There appears to be no practical manner of ridding the ordinary farm barn of weevils, other than the liberal use of hot water. The ceiling and walls should first be cleanly swept, and then all parts of the barn thoroughly wetted with boiling water, taken from a boiler placed just outside the barn door. If this is done on a hot day, all weevils that crawl out of the building on the hot sides of the barn will be killed, and then it is only necessary to treat the shady sides of the outside with hot water.

WHEAT AND ITS DISEASES.

[Summary of an address delivered to the Mount Barker Agricultural Bureau by Mr. W. J. SPAFFORD, Superintendent of Experimental Work.]

The history of wheat as a crop is that of civilised man, and when we first have records of him the wheat plant was highly improved. The grain of this crop is the most important of our vegetable foods in the present civilisation, and the amount of this grain needed in the world is becoming greater and greater. The populations of wheat-eating nations, before this terrible war upset things, were increasing more rapidly than was the production of wheat, and to this must be added the fact that the Eastern people are just beginning to make it one of their foods. The increasing demand for wheat must continue for some long period of time, so that we must know as much about the production of maximum yields as is possible, of this, the main crop we can grow in South Australia.

SOILS.

In countries where farming has been practised long enough to have been able to decide the correct position for the various crops, the heavier types of land are recognised as the most suitable for the wheat crop, but in this country, where all of our soils are comparatively new, there are not many soils that will not carry profitable crops of this plant. As the natural fertility is worked out of the soil, we will evolve special systems of cropping for all of the different conditions, and we will then find, in common with other countries, that the heavier lands are the wheat lands.

Tillage for Wheat.

The success of the wheat crop is very largely dependent on a good seed bed, and the experience of thousands of years of wheat-growing has shown this to be land that has been ploughed up, kept free from weeds, and so worked down that the under layers are very compact and only the immediate surface is loose. All cultivations subsequent to the ploughing lead ultimately to the formation of the seed-bed, and cultivators should see to it that each one of the tillage operations does something towards attaining the ideal conditions set out above. Rain is the best agent in compacting the under layers of the soil, and when this has not been sufficiently heavy to do the work, the land roller should be brought into action. Proper tillage encourages the activities of useful soil bacteria, and, in this country, does away with the necessity of applying nitrogenous manures to the wheat crops—an essential addition in the older countries for maximum returns.

Manuring of Wheat.

The mineral matters of the soil required by the wheat crop that are only likely to be present to a limited extent are potash, nitrogen, phosphoric acid, and lime. Analyses show the vast majority of South Australian soils to be exceptionally rich in potash, and field experiments show that in most cases the supplies are ample for wheat crops, so that to date there is no need to apply potassic manures to this crop. Nitrogenous manures are quite essential in most wheat-growing countries, but with us the work of nitrogen-gathering bacteria in our comparatively new soils and warm climate so far do away with the need of these applications. Our soils are lacking in phosphoric acid, and it has been found quite necessary to apply this substance in the form of phosphate of lime; to date superphosphate has been the most successful form of phosphatic fertilizer, but in districts with good rainfall, finely ground raw rock phosphate would probably be as effective, and possibly cheaper. This substance, to be useful, should be so ground that 90 per cent. of it will pass through a sieve with 10,000 meshes to the square inch. Wherever lime is lacking, this substance should be used to correct the soil acidity, and so (1) encourage the activities of useful soil bacteria, (2) discourage the growth of many of our bad weeds, (3) allow the crops to make full use of what phosphates are applied, and (4) help to become available to plants other mineral plant foods.

Varieties.

All farmers grow more than one class of wheat, and to get maximum returns they should be careful that they are sown in their correct order, as, late wheats first, then mid-season varieties, and finally the early kinds. As new varieties are constantly being placed on the market, many of them better than the standard varieties grown for special conditions, and, as a difference in yield of a bushel to the acre may make all the difference between profit and loss, all growers should test possibly suitable new varieties as well as their favorites.

Position of Crop.

Where more than one crop is grown, there is a correct order for these different crops to follow in every field if the best results are to be obtained. If a bare-fallow comes in the rotation, wheat should be grown on this; if no bare-fallow, then wheat should follow the leguminous crop; if neither bare-fallow nor leguminous crop, then wheat should follow the cultivated crop.

Diseases.

The wheat plant is subject to the attacks of various fungus diseases, the main ones that cause damage to the crop being:—

Bunt, or Stinking Smut.—(1) The spores of bunt take the place of the whole of the affected grains, except the outside skin. (2) The wheat crops are injured by the bunt spores lodging on the grain, and thus being sown with the seed. (3) The only practicable method of eradicating or checking bunt is by treating the seed with a solution of a fungicide. (4) A 1 per cent. solution of copper sulphate takes pride of place as a farmer's method of treatment. (5) For best results this solution should be poured on heaps of loose wheat on a floor, and mixed with shovels until thoroughly wet. (6) A ¼ per cent. solution of standard formalin is a good pickle provided the grain is sown while still damp.

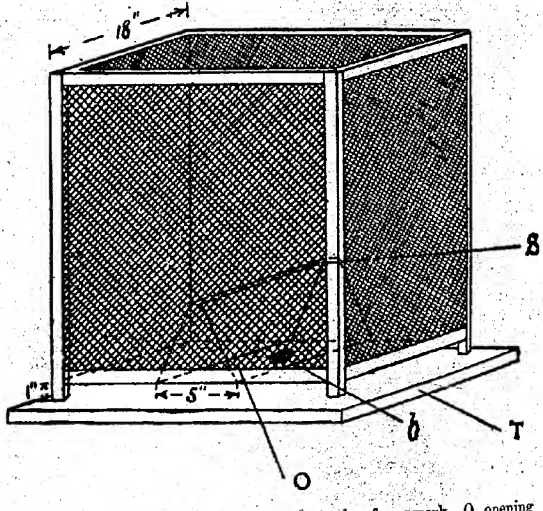
Loose Smut.—(1) The spores of loose smut take the place of the whole of affected heads except the central stalks. (2) The grain is affected with this disease by the spores dropping on the ovary, growing into it, and remaining in a resting stage until the grain germinates. (3) This disease at present does so little damage to our crops that it is not worth the expense of specially treating the seed; but should it ever get bad enough to warrant it, immersion in water at 110deg. Fahr. to 115deg. Fahr. for three hours will check it

Take-all.—(1) Take-all is characterised by the more or less circular shape of the affected patches, and by the presence of dark powder or stain at the base of affected straws. (2) Infection with this disease appears to come wholly from the soil, particularly from the straw of affected plants. (3) As preventive measures, the stubble from affected crops should be burnt, land should be kept free from weeds, a variety of crops should be grown. Good mechanical condition of the soil at seeding time should be aimed at, so that the young wheat plants will be strong enough to grow away from the parasite. Rolling the land heavily should be resorted to whenever it is doubtful if the under-surface is well compacted together.

Red Rust.—(1) Red rust is characterised by affected wheat plants showing longish patches of powder of an iron-rust reddish color on leaves, sheaths, and even stem and ear, from heading time until drying or ripening. (2) The mode of infection by rust is not yet thoroughly understood, but it appears likely that attacks are started by uredo-spores being blown from district to district or country to country by winds. (3) The only known practical method of preventing this disease is by using rust-resistant and rust-escaping varieties of wheat.

THE FLY PEST.

Capt. J. Davidson, D.Sc., F.E.S., R.A.M.C.(T.), in the course of a paper entitled "Some Practical Methods Adopted for the Control of Flies in the Egyptian Campaign," and published in the Bulletin of Entomological Research, describes a fly trap that had been used with considerable success. The Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) states that this type of trap should be effectual in the fight against the blowfly, and also as a means of keeping down the house and stable fly.



Fly cage made with wire gauze on a wooden framework—O, opening on floor of cage; S, narrow opening leading into the cage between the two inclined pieces of wire gauze; T, wooden tray; B, bait.

The trap consists of a box with wooden frame-work forming a cubical cage of 18in. a side. The sides are of wire gauze, and the top is covered with mosquito netting. The bottom is made of light wood, the central portion (O), 5in. wide, being left open, forming an opening 18in. x 5in. Along the sides of this opening two pieces of wire gauze (18in. x 7in.) are fixed, inclined inwards, and approximating, but just leaving sufficient space (S) for flies to get through into the cage. The cage, standing on legs 1in. high, is placed on a wooden tray (T). The part of the tray immediately below the opening (O) is painted black, and the bait is placed on this in the position (b). The flies, attracted by the bait, get into the angle between the two inclined pieces of wire gauze, and

make their way upwards towards the light through the narrow slit (S) into the cage. It is necessary to have the cage only just wide enough for flies to get through. A bait of vinegar, sugar, and bread can be used. The flies in the cage can be destroyed by fumigation with pyrethrum powder, or cresol heated in a tin. The smell which remains about the cage after fumigation tends to keep the flies away, so they were allowed to pass from the cage into a bag made with mosquito netting, and were then fumigated.

ORCHARD PESTS AND HOW TO COMBAT THEM.

At the recent Conference of the River Murray Branches of the Agricultural Bureau, Mr. W. Francis, of the Waikerie Branch, contributed a paper, in the course of which he dealt briefly with the many pests against which the orchardist had to contend. Birds were troublesome and destructive, he said, and the starling and a bird somewhat similar to the wattle bird, were two of the worst foes the orchardist had to fight. The most effective weapon was the small-bore shot gun. He considered the sparrows a friend of the orchardist, because of the number of moths and caterpillars they destroyed. Should they become troublesome they could be very easily destroyed by sprinkling a couple of handfuls of good wheat mixed with chaff around the fruit racks for a few days, and then using poisoned grain.

In so far as insect pests were concerned he considered the black and green aphis the worst, because they multiplied so rapidly and were carried from one tree to another by small ants. By way of treatment, he suggested that the soil at the butt of the tree should be opened out, because those insects had their winter home in the soil, and the trees should be thoroughly sprayed every other day if possible with tobacco wash, kerosine emulsion, or resin wash. Resin wash made as follows had given him the best results:—4lbs. resin, 3lbs. washing soda, and ½lb. softsoap to every 20galls. of water. The resin should be crushed to a powder, and the soda dissolved in 2galls. of boiling water. The resin should then be poured slowly into the soda solution, and finally the soft soap put into the mixture. It was very necessary to stir the solution while adding the different ingredients. The balance of the water could then be added, and the mixture would be ready for use.

Codlin Moth.

Six years ago the codlin moth had obtained a footing in the Waikerie district, and since then it had rapidly increased. Last season he had twice sprayed all trees, with the exception of three. From those trees

he did not receive 20 per cent. of clean fruit, although they were well sprayed when the blossom petals were falling. From the trees that were sprayed a second time, about a fortnight later, 80 per cent. of clean fruit was obtained, but some of the neighbors did not spray, and the late apples were badly attacked by moths during February. Where two apples rested against each other, or where a leaf rested against an apple he found young grubs just beginning to bore their way into the apples, and he thought that to effectively deal with the late brood of moths, another spraying should be given to the trees during January.

Rutherglen Bug.

The Rutherglen bug or fly was nearly always troublesome during a dry summer. It made its appearance just when the crops began to ripen, and then spread through the orchards and vineyards, leaving the vines as if a fire had passed over them. Clean orchards were supposed to be the most effective remedy, but he had seen clean orchards and vineyards suffer very badly, because the pest had nothing else but the fruit of the trees to feed on. By placing dry rubbish around the butt of the trees, and then placing a wet bag on the top of it, and setting alight to the lot just at dusk, a number of the pests would be destroyed, but the best remedy he had found was to place in oil drums or kerosine tins a few pieces of dry cow manure which had been previously soaked in coal tar. A light should be applied, and the fuel damped occasionally to prevent it blazing up. That would make a dense smoke, and most of the insects would be destroyed. A sheet of tanglefoot tied around a lighted hurricane lantern and placed in the trees would also dispose of numbers of the pests and many codlin moths, but it was rather expensive.

Soldier Bug.

The soldier bug was another pest that needed careful watching, and one that could not be mistaken because of the very distinct cross on his back. He was generally found at work during the spring months of the year, destroying the young shoots on apricot and orange trees. Some years ago he had asked for a remedy for the destruction of that pest, and had been told that the soldier bug destroyed many other insects, and that he was best left alone. He had carefully studied the work of the soldier bug through a magnifying glass, and all the work he had seen that insect do was eating the young growth on the trees. The only remedy he knew of was to put on a pair of leather pruning gloves and clap both hands together on the bug.

Red Spider.

Red spider was another pest that was very bad on almond, peach, and apricot trees during a long, dry spring and summer. Correctly speaking, that insect was not a spider, but a very small spinning mite that left a reddish mark on the underside of the limbs and in the crevices of the bark of the trees. A heavy thunderstorm would at times clear it out, but he thought a good force spray would have the same effect, or a 5 per cent. solution of carbolic acid and water. The solution should be handled very carefully, and the underside of the limbs of the trees

thoroughly sprayed, commencing from the bottom of the tree and working upwards. Resin wash was also effective. Orange scale on young trees could be cleared by a couple of good sprayings of resin wash, allowing a week between each spraying, but trees of a more mature age should be fumigated.

Apricot Scab.

Apricot scab was one of the worst fungus pests that the orchardist had to combat. The spores of that pest wintered in the dry crevices of the rough bark, and the scales of the fruit buds. When the spring and early summer was dry the fungus did not spread much, but should the season be moist and humid just as the buds were beginning to break, the spores would spread rapidly and take hold of the tender leaves and fruit just as they commenced to develop. The fruit was covered with dark blotches and ruined, the leaves fell, and the tree soon died. During the last two seasons at Waikerie several apricot trees had been destroyed by that fungus, and he advised growers to watch their trees, and when they observed small holes in the leaves and the fruit marked with blotches, to use the spray pump, and give the trees a thorough spraying with Bordeaux or Burgundy mixture, using a half-strength spray for summer, and going over the trees twice. In the following autumn, just as the leaves were falling the trees should be sprayed, and again in the spring, just when the buds were swelling. They should be sprayed with a full-strength mixture, working upwards from the butt of the tree.

Curl Leaf.

Some years ago 50 per cent. of the crop of Elberta peaches and prunes in the Waikerie district was spoilt by the curl leaf fungus. The fruit spurs of the following crop were also attacked, so that the crop was a failure, but after three years of spraying the trees had come back to healthy, profitable growth. The Lady Palmerston, Salway, Early Crawford, and Foster peaches had never been sprayed, and they were quite free of curl leaf, although they were growing alongside of the Elbertas. The Stanwick nectarine was attacked by a fungus disease resembling curl leaf. The leaves and buds when half opened withered and dropped off, the lateral wood became brittle, the bark when cut through looked like a streaky piece of bacon, and the limbs looked as though opossums had been sharpening their claws on the wood. That fungus could be checked by spraying with bluestone, and after three years of treatment his trees were once more back to healthy fruit-bearing condition.

Black Spot.

Black spot on apples and pears was another fungus that caused a large amount of damage in wet seasons. The Cleopatra and Ben Davis were badly attacked, but Jonathans and Rome Beauty did not suffer to the same extent. The fungus attacked the young leaves in the spring, and destroyed them and gave the tree a scorched and blighted appearance. The fruit also became spotted, but a good spraying with bluestone would restore the trees to a healthy condition. When making Bordeaux mixture one should dissolve the lime in one vessel and the

bluestone in another, and then mix the two solutions carefully. For some years he had used the bluestone solution only for curl leaf, shot-hole fungus, and black spot on apples, and it had given excellent results. One should be most careful to use wooden or copper vessels for preparing the bluestone solution, because the acid very quickly penetrated any article made of tin. To cause the bluestone to dissolve quickly, it should first be crushed and then stirred in boiling water. Every particle of the bluestone should be dissolved before spraying, otherwise the foliage of the trees would be scorched. Codlin moth, curl leaf, shot hole fungus, and peach aphis would destroy 50 per cent. to 80 per cent. of the fruit crop in one season, and any of the last-named three pests would kill the trees in a short space of time. Spraying would cost about £2 per acre each time the work was performed, and the crop of the orchard was worth approximately £40 per acre, and if one allowed for three sprayings per annum there would be a profit of at least £20 per acre. He suggested that three growers should co-operate and purchase a double spraying outfit, thereby effecting a considerable saving in labor and expense. Those growers who were just commencing a career as orchardists, should, if they found their trees suffering from some disease that was unknown to them, ask for assistance from one of the older settlers of the district, and see if they could identify the pest; failing that the insect should be carefully packed and sent to the Department of Agriculture for identification. If they wished to keep their blocks in a good healthy condition they should watch the trees closely in the early spring months or some of the many pests that had to be destroyed would gain a footing in the orchard with disastrous results.

Other Opinions.

In opening the discussion on the paper, Mr. C. C. Savage (Manager of the Berri Experimental Farm) said he was surprised that Mr. Francis had not made reference to the ring-neck parrot. He considered that was one of the worst bird pests they had to deal with. The black and green aphis were very destructive, but the green aphis was the more troublesome. The leaves of the tree curled up as soon as the insect attacked them. The best method for dealing with them was to spray the trees with tobacco wash to which a small quantity of resin wash had been added. He did not agree that the small black ant carried the aphides from one tree to another. The question as to whether those insects harbored in the soil was a debatable one. Any solution in which sulphur had been mixed would be effective in dealing with the red spider. For the shot hole fungus the trees should be well sprayed during autumn. At the Blackwood Experimental Orchard they had successfully treated trees affected with curl leaf by spraying with Burgundy mixture. Mr. H. Taylor (Renmark) cited the case of an orchardist in Renmark who had protected his trees from aphis by applying a band of some sticky substance around the trunk of the tree. Mr. F. Basey (Renmark) stated that red oil spray had given him the best results in combating the Rutherglen bug. Mr. A. J. Strang (Berri) stated that he had effectively dealt with black aphis by spraying the trees twice with a solution of soap.

THE EVAPORATION OF FRUIT FOR COMMERCIAL USE.

[A paper read at the Agricultural Bureau Conference at Berri by GERALD W. BEVERLEY, Pyap, S.A.]

It is with some diffidence that I prepare to read my paper to you, as I can hardly claim to be in a position to give you definite information of an entirely satisfactory nature as to the drying of fruit by evaporation, and I think that my paper should more rightly be entitled "Experiments in Fruit-drying by Evaporation"; for, although we have successfully dried fruit this year at Pyap, the drying of fruit by evaporation is yet in its experimental stages, and has to undergo many changes and improvements before the process arrives at such a completely satisfactory stage that it can compare favorably, in cost and sample, with rack-dried fruit. Yet the installation of some means by which our fruit (particularly vine products) can be artificially dried in a bad drying season has become so important that it is necessary to try all means at our disposal to ensure our fruit getting dried, or at least getting our drying completed, in a wet season such as 1917.

Our first experiments were during the 1917 season, when our fruit had been practically three-parts dried, and then got saturated with rain while on the hessians. We constructed a wooden room, 24ft. by 10ft., of flooring boards, and stacked the fruit on 4ft. wooden trays inside the room. A furnace was built outside, about half a chain from the room, with a heating flue from the furnace going through the room along the earthen floor, with a chimney at the end to draw off any smoke or gases generated by the fire of mallee roots which we used. The air was driven into the room by means of a fan ingeniously made from the beaters of an old stripper, which was enclosed in a framework of galvanized sheet iron, and was capable of revolving at 1,200 revolutions per minute, and discharging a cubic air capacity of 2,400ft. per minute. The air driven in through a 7in. cast-iron pipe heated by the furnace reached 210deg. Fahr. by the time it was delivered into the room, the temperature of which reached 90deg. on the top of the room, and 110deg. at the bottom, the outside temperature at the same time being only 56deg.

The drying of the fruit took from 10 to 18 hours, according to the moisture of the fruit when put into the room, but we found that although the fruit was quite chippy when taken out of the drying room, it took up again on being stacked outside, and became quite moist and sticky. Several tons of fruit was processed in this way, but although the fruit was dried sufficiently to go through the grader, the ultimate result was not satisfactory, the fruit sweating after it was packed. One big drawback that we had to contend with was that the fruit had got sticky before it was put into the room, owing to the sugar having come through the skin through rolling the fruit up in the hessians before it was thoroughly dry, and thus causing a coating of sugar on the outside of the berries that prevented them drying as quickly as they would otherwise have done. The opinion of our engineer, who has had a good deal of experience in the kiln drying of cereals in

England, was that the cause of our failure to make the drying a success was that there was not sufficient draught to carry off the moisture, and although we raised the height of the flue, we did not attain the required object. Some months ago my attention was called to an evaporator designed by a firm in this State, and while on a visit to town I inspected the original design of the kiln from which this company have designed their present drying kilns. The idea at once struck both our engineer and myself as being the most likely thing to effectively dry fruit, and the few samples of kiln-dried fruit that we inspected, although of very inferior quality, showed us that the inventor was on the right track. Several obvious improvements were suggested by us, and these have to some extent been adopted by the company in their latest kilns. Having come to some business arrangements with this enterprising company, my firm arranged for them to commence operations at Pyap and construct a kiln in order to thoroughly test this important means of disposing of fruit that was delayed by a late season, and also to test the claims of the inventors that fruit could be successfully dried from the fresh fruit in 12 hours. To give this company their just due, they spared neither money nor trouble in trying every experiment to make their kiln a success, but although they have this year dried nearly all varieties of fruit from the fresh stage, they have not been able to dry it in the time stated, viz., 12 hours for Sultanas and Gordos, and from 10 to 12 hours for currants.

I think the company made a mistake in their estimates of time of drying, as all their experiments had been conducted with non-irrigated fruit; and when they came to handling the large and heavy-bodied fruit from irrigated orchards, they found that it required a considerable amount more evaporation than that grown without irrigation and chemical manuring. The exceptions are stone fruits, pears, and apples, and these have been successfully dried within the stated time, and compare most favorably for color, weight, and grade with sun-dried fruit, the time taken for the afore-mentioned fruits being—apples, 6 hours from fresh fruit; apricots and peaches, 8 hours; and pears, 10 to 12 hours. I produce samples of apples dried by us at Pyap, and also samples dried by the company at their kilns in one of the suburbs of Adelaide.

The kiln at Pyap is 15ft. in diameter, and it contains four crates, capable, it is claimed, of holding equal to 1 ton of dried fruit each filling, which it was expected would be dried in 12 hours. The crates are run in on a tram line on to a revolving turntable, which is driven by a chain drive from the engine used for driving the fan which delivers the hot-air blast into the kiln. The crates have ledges so as to carry the trays, which are made either of fine wooden slats or wire netting, and these crates revolve at the rate of six to seven revolutions per minute, which serves to create a circulation of air in the kiln and prevents the hot air over-drying or roasting the fruit.

The crates were designed to allow 1in. air space between the trays, but we found, with our large and heavy-bodied fruit, that we could only put in alternate trays, and this of course halved the drying

capacity of the kiln, and increased the cost of the drying, for instead of getting 1 ton of dried fruit from each filling of the kiln, we only received about 12cwts. of dried fruit. We had to try a great many experiments with the Pyap kiln before the blast was properly regulated, our trouble being that some of the fruit was overdried on the trays whilst other trays were hardly affected by the interior heat of the kiln. After several trials the samples of currants and Sultanas exhibited were successfully dried out from fresh fruit, the time occupied in producing the finished articles being in the case of currants and Sultanas 24 hours, and Gordos 30 to 32 hours. I would prefer to leave the judgment as to quality to the gentlemen present, all of whom are practical fruitgrowers, but the quality is not equal to the rack-dried fruit, a sample of which I produce, and the cost of drying is greater than rack-dried fruit in good weather.

The Sultanas that were kiln-dried, weighed before going into the kiln and after the fruit was dried, dried out just 3½ to 1. This compares favorably for weight of rack-dried fruit, but the color of the latter is superior, and the grade higher. The principal thing to remember, however, is that, although the cost of drying in a good season on racks would probably be cheaper than kiln drying, yet there is always the fear of having the fruit spoilt by rain unless the racks are roofed with iron, and with the season getting later every year it will be absolutely necessary to make provision for artificial drying. I am quite convinced that for stone fruits, apples, and pears this class of kiln is already quite capable of turning out a first-class article, and one great benefit with sulphured fruit is that it can be placed in the kiln immediately after sulphuring without any risk of a dust storm spoiling the sample before it is properly dried, as from my own experience that has more than once been the case.

It is also claimed for evaporated fruit that its keeping qualities are greatly increased, as, owing to never being placed in the sun, it is not open to the attacks of moths, which, it is stated, lay their eggs on the fruit while it is drying, and these hatch out after the fruit is packed.

After the trials given the evaporator this season both at Pyap and Mildura, the owners and ourselves have come to the conclusion that a smaller kiln containing one crate would dry the fruit quicker and cheaper than the four-crate kiln, and also be within the reach of smaller growers, while several of the smaller kilns would ensure continuous drying, as by the time the fourth kiln was filled the first kiln would be ready to refill. I cannot at present speak with any authority or experience of this latter method, but we shall probably be experimenting with the smaller kiln shortly, and I may at a later day be able to supply further information on this point.

In the discussion that followed the reading of the paper the Minister of Agriculture (Mr. Anstey) pointed out that it would be some time before galvanized iron and wire netting were back to normal prices, and that would have to be considered when reckoning the price of the rack and kiln. Mr. Howie (Renmark) enquired whether the evaporator mentioned by the speaker could be used for drying pears. Mr. Beverley replied that pears dried in the kiln at Mildura compared very favorably with the sun-dried article. Mr. G. G. Savage

(Manager of the Berri Experimental Orchard) said he had had experience with the evaporation of fruit at the Blackwood Orchard. They had found a difficulty in getting the hot air and moisture away from the kiln. Apples dried in the evaporator in seven hours were of a much better color than those exposed to the sun. He had obtained best results from the use of wire netting trays, but they must be lacquered to withstand the action of the sulphur.

MURRAY BRIDGE HIGH SCHOOL.

AGRICULTURAL TEACHING.

It has been directed by the Minister of Education that the Murray Bridge High School, in addition to teaching the subjects of general education, shall give special attention to those subjects that form the foundation of the science of agriculture. The leading agricultural countries of the world have shown that they believe the farmer should be a trained man, by establishing for their lads various grades of agricultural schools, grading up to the agricultural college.

In the above school, in addition to the subjects of general education, special attention will be given to the foundational work in such subjects as (1) chemistry and physics, especially of plants and soils; (2) botany and other natural sciences; (3) farm bookkeeping; (4) farm correspondence. Experimental work will be undertaken in the school gardens, including operations pertaining to soil, fruit, and vegetable garden, fodder, and cereal crops. A most interesting and valuable series of talks and demonstrations has been given to the scholars during the present year by the following experts of the Agricultural Department:—Mr. F. E. Place, B.V.Sc., M.R.C.V.S. (Government Veterinary Lecturer), three lectures on the horse; Mr. Darwent, two lectures on pruning and spraying; Mr. H. W. Andrews (Botanical Assistant), seeds and weeds; Mr. P. H. Suter (Dairy Expert), dairying. This co-operation of the Agricultural Department is of high value to the scholars.

A special feature of the future aim of the school will be the preparation of scholars for the Roseworthy College. Several Roseworthy scholarships have in the past been secured by students of the Murray Bridge High School; these enable their holders to attend for three years at Roseworthy. It is probable that further arrangements will be made, whereby promising boys in this High School shall have special opportunities for continuing their agricultural studies. The special scientific and experimental work at this school is being undertaken by Mr. A. R. Hilton and Mr. R. S. Booth.

The residents of Murray Bridge are fully aware of the importance and value of the establishment of such a specialised High School for their district, and are showing their interest in a most practical manner. Local effort is being made to purchase a valuable site of five acres for the proposed new building for this school.

For scholars needing accommodation the Murray Bridge High School Council will find same in the town. Application should be made to Mr. F. Heddle, Murray Bridge.

ORCHARD IRRIGATION.

[A paper read by Mr. F. R. ARNDT, at the Conference of River Murray Branches of the Agricultural Bureau, held at Berri, on May 22nd, 1918.]

Land may be irrigated by three different methods, namely, sprinklers, flooding, and furrows.

Orchard irrigation by means of a system of sprinklers is as yet still in the experimental stage, and has so far been practised on but few plantations. Theoretically, this method of watering has many advantages over the furrow system, as it gives a more even distribution of water, does not saturate the subsoil, and requires less water per acre to give a satisfactory watering. Should such experiments as are at present being conducted with this system of irrigation be able to substantiate the theoretical advantages that are claimed for it, it is highly probable that this way of applying water will, in the near future, supersede other methods to a considerable extent, more especially on such plantations on which the water is at present being conveyed by means of pipes in place of the usual open channels.

The check system of irrigation—that of flooding the land with an even sheet of water, is sometimes practised on level land of a somewhat stiff nature, such as exists on some of the river flats; but owing to the heavy cost of grading the land into level checks, this method is not practised where the land is at all hilly and undulating.

The furrow system of irrigation is the one usually practised in orchards. One or more furrows are ploughed along each side of the trees or vines to be watered, and the water is allowed to run along them until the end plants have received sufficient moisture. The great advantages of this method of watering are that it can be used upon land that is too steep to grade into level checks, except at too great expense, and that the water, being confined to the furrows, does not flow over the land and consolidate the surface. The disadvantage of this system is that the first plant of a row must necessarily get more water than the last one, and for that reason the rows should be so laid out that the water does not take too long to reach the end.

LAYING OUT NEW ORCHARDS FOR WATERING.

For the best results to be obtained from the irrigation of a piece of land, it is necessary that the land should be correctly laid out for watering from the beginning. As the furrow system of irrigation has almost invariably been the method of watering practised in orchards and vineyards, and therefore being practically the only way of applying water from which much experience has been gained by fruitgrowers, this method of irrigation will probably be used in the watering of orchards and vineyards for many years to come, and is the only method that we need here consider.

In the laying out of a new orchard, after the land has been cleared and graded, the irrigation channels should next be put down. Where the soil is of a loose, sandy nature, the irrigation ditches should be constructed from a substance practically impervious to water, such as lime or cement concrete, or in place of open channels cement piping may be used.

The greatest care should be exercised as to where the channels are put down. Upon the position of the channels depends the length of the rows of trees and vines to be watered. Experience has shown that in loose, sandy loam, rows 5 chains in length are long enough, and that on no consideration should rows over 6 chains long be watered in one section. On hard, flat land it is possible to water with longer rows than on sandy rises, but even here it is not wise to have rows over 10 chains long.

As by the furrow system of irrigation the water is flowing for a considerable time past the first trees of a row before it reaches the last one, and the longer the rows are the longer will the water take to reach the end, therefore on very long rows the first tree will have had too much water before the last tree has had enough, and the top of the land will in time become waterlogged, to the injury of the trees. In any case, the surplus water will soak down the slopes along the subsoil, and should this come close to the surface of the ground, the water will rise in the form of seepage. Having short rows means, of course, much channeling, which greatly adds to the first cost of the place; but it will pay in the long run in the ease with which the land can be watered, and in the satisfactory growth of the trees.

Another matter in which care has to be exercised is to see that the channels are so situated that the grade of watering is not too steep or too level. On sandy rises a fall of 1ft. to the chain along the rows of the trees or vines is sufficient grade along which to water, while anything under 4in. to the chain is too little. It is a mistake to water straight down steep slopes, as the force of the water washes deep gutters in the land at the top. The washed-out soil carried down by the water silts up the furrows farther down the slope, causing the water to spread over the land at that place, so that very little water reaches the end of the rows.

Where the land is hard, as on most of the river flats, the grade along which to irrigate may be considerably less than upon sandy rises, as the soil absorbs the water far more slowly than is the case with the looser land. The danger of watering along an almost level grade on loose, sandy land is that, through the porous nature of the soil, the water sinks in so rapidly that the top ends of the rows get too much water before the bottom ends have had sufficient, and unless the drainage of the land is excellent, such a system of watering will sooner or later cause seepage to appear lower down the slopes. Thus it is not safe to water with a fall of less than 4in. to the chain on sandy rises, from 6in. to 9in. to the chain being the most convenient grades; while on hard, flat land a fall of as little as 1in. to 2in. to the chain may be used with safety.

Where the contour of the land is such that the only way to water is to irrigate down a steep slope, then the rows should be very short.

Rows that have a grade of one in thirty, or less, should not be longer than 3 chains, the principle to follow being the steeper the grade the shorter the rows. By this means the land can be watered with a small stream running down the rows, which, while strong enough to reach the end, is still not too strong to cause much washing of soil from on top. Long rows require a strong stream to flow along them to reach the end, and this, on a steep slope, washes deep gutters into the top portion of the land.

Cement Piping.

Conveying water by means of reinforced cement piping instead of the usual open lime-concrete channels is one of the latest products of irrigation development. This method of water delivery is, according to American advices, rapidly coming into favor in California. Last year some hundreds of chains of cement pipes were put down by Berri irrigationists instead of channels; and the 16 chains of cement piping installed by the writer has given him some little insight into the possibilities of this method of water delivery. The chief advantages claimed for cement piping are:—Firstly, its great strength and durability. Well-made reinforced cement pipes should prove very lasting; and there seems little reason to doubt that such pipes, working under a low pressure, should last a century with very little in the way of repairs; while a lime-concrete channel situated on the average irrigated land would probably want renewing three or four times during that period. Secondly, its greater resistance, as compared with lime-concrete channeling, to the attacks of such alkalies as are often dissolved by irrigation water. Thirdly, the saving of land that may be effected, as compared with open channels, by doing away with the necessity for headlands where water has to be conveyed through the plantation, by burying the pipes to a depth of 1ft. to 18in. in the ground, so that cultivation may take place over them.

After one season's trial the writer believes that the cement pipe has come to stay, and that the advantages arising from doing away with headlands in the middle of a plantation alone justifies its adoption in a block of any considerable extent. One of the matters wherein improvement can still be made is in the outlets that discharge the water into the furrows. The present outlets used, although serviceable, can hardly be said to be ideally suited for the work they have to perform; but the problem of evolving an ideal outlet that would not be prohibitive in price should certainly not prove insoluble, and will probably yield to further experiment in the near future. Regarding the cost of installation, it is at present somewhat more expensive to lay out the land for irrigation by means of cement piping than with lime-concrete channeling. This is the case even on land having a steep grade, where a small pipe will convey a large volume of water; but on land that is practically level, very large pipes are required, and consequently the expense of installation is great. On present prices it will probably not pay to use cement pipes unless they are working under a water pressure of at least 4ft.

In watering vines the pipe line should run underground in a straight line along the top headland, at a distance of about 4ft to 6ft. from the first vines. Outlets should be placed exactly in a straight line with

the rows they are to water, and to prevent their being struck by implements when the vineyard is being cultivated, they should be protected by the strainers of the trellis being put down just alongside them on the outside of the pipe line. Long rows of vines that are irrigated in two sections by having a second line of underground piping watering the bottom half of the rows should have the outlets of this pipe line protected by placing trellis posts in the same row immediately behind them.

In watering trees where, of course, the standpipes of the outlets cannot be protected by trellis posts, the pipe line must be so placed that the outlets are not in the way of, and therefore do not receive injury from, implements when the orchard is being cultivated. Where the orchard is watered from a headland along a boundary fence, and where a headland of 20ft. to 24ft. must be left in any case, the pipe line is best situated close to the fence. But where the pipe line crosses the orchard, it must be so placed that headlands are done away with as much as possible, and that the outlets, especially those having standpipes, do not interfere with cultivation. In that case the pipe line must be put down fairly close to the trees to be watered—a distance of about 4ft. to 6ft.; for if put farther away than this the standpipes of the outlets will be in the way of cross cultivation. By having the outlets close to the trees they will, when the trees reach maturity, be well shielded and protected by the overhanging branches, and be thus well out of the way of the plough and cultivator, although in the early years of the orchard's existence this will not be the case, and care in cultivating near the outlets will be necessary. Where the line of watering is straight down a slope, and two outlets are used to each row of trees, these may be placed fairly close to each other, as the fall in the land allows the water to be led with ease along either side of the row. In such a case the outlets may be placed anything from 18in. to 3ft. away from the centre of the row, or from 3ft. to 6ft. away from each other. Where the watering is along the side of a steep hill, then it is best for the outlets to be as far away from each other as this can be accomplished without their being in the way of horse cultivation, as the outlet watering the top side of row of trees must be at least as high as the furrow it has to irrigate, or the water will not flow; therefore the outlets will, in many instances, have to be placed a distance of 4ft. to 6ft. on the top side of the rows to be watered. A metal standpipe, with a tap, situated underneath the branches of a tree, and supplied with a short piece of hose whereby the water could be led into either the top or bottom furrows, would probably solve the outlet problem; but owing to the present high cost of metal, this method of watering would be very expensive to install.

The foregoing remarks apply only to outlets having standpipes from which the water is delivered into the furrows. Outlets that are situated low down close to the pipe can be placed at any required place along the pipe line, as cultivation can take place over them. However, such outlets take some trouble in locating after the land on top of them has been cultivated, and, moreover, require the removal of a foot or so of soil from above them before they are accessible.

Another advantage in having the orchard irrigated by means of cement piping is that should it at any time be desired to install the

sprinkler system of watering, this could be accomplished with a small amount of expense, as the piping could be utilised for the new method of watering.

Water Management.

As has been previously pointed out, it is necessary to the success of the orchard that every tree should have as nearly as possible the same amount of water, and that the watering should be so managed that the water does not take too long to reach the last trees of the row, nor that it be so rapid as to cause a washing away of the soil at the beginning of the row. As far as circumstances will permit, these ends may be attained by the application of the following principles to the varying conditions of soil and grade:—Firstly, fairly level land of a stiff nature, whether watered by flooding or by furrows, may be watered with a large stream of water running into the checks or along the furrows, as the grade (if any) is insufficient to cause a washing away of soil, and the soil too tenacious to absorb the water quickly. On the river flat land it is, on the whole, not quite so essential to economise in the use of water as it is on the high lands, as the underdrainage is usually good; but heavy watering may result in waterlogging the land for a time, to the injury of the trees. Secondly, short, steep rows on sandy land should be watered with a small stream running along the furrows for a comparatively long time. Watering with a large stream down steep slopes soon washes the top soil way, causing deep gutters to form; while the washed-out soil silts up the furrows farther down the slope, so that the water spreads there, and very little reaches the end of the rows. Watering with a small stream will not cause this trouble; but as by this means the quantity of water going into the soil is not very great at any time, the time of watering should be extended. Thirdly, rows of 5 chains in length on sandy slopes with a grade of about 9in. to the chain give very satisfactory results in watering. These are best irrigated with a moderate to large stream along the furrows, and will give little or no trouble through silting. The size of the stream to use depends not only on the grade, but also on the nature of the land. The sandier the land is the more moisture will it absorb, and the water will take longer to get to the end of the rows. Therefore, to get as nearly as possible an even distribution of water over the whole orchard, it is necessary, other things being equal, to make it a rule in irrigating to follow the principle of the sandier the land the larger the stream. Fourthly, rows of moderate length with but little grade on sandy land should be watered with a large stream running along the furrows for a comparatively short time; for to water such rows with a moderate or small stream would cause the top trees of the row to receive too much water before the last ones have had sufficient.

One of the quickest ways to ruin a piece of land is to water along a gentle grade with a small stream, or along a fairly steep grade with a large stream. In both instances the upper portions of the rows receive too much water, and the lower portions too little, with the likelihood of seepage appearing on the lower part of the holding at some future time.

The chief work in connection with the irrigation of the orchard is to see that the furrows are kept running. Weeds and leaves will occasionally block the outlet pipes, and these must be removed. Furrows that are silting up must be cleaned, and repairs effected to those that have burst. Where the land has been well laid out for watering, not much work is experienced in its irrigation; still, it is necessary for a man to be in attendance for the greater portion of the time to see that all goes well.

Amount of Water to Use.

The art of irrigation may be said to consist of in securing the maximum of crop from the minimum of water. The advantages of not using more water than is absolutely necessary are apparent for three reasons:—Firstly, that irrigation should not be unduly prolonged, as this results in a waste of time and labor; secondly, that the economical use of water lessens the danger from seepage; and, thirdly, that excessive watering leaches out the most expensive plant foods, such as nitrates, contained in the soil, and carries them deep down into the subsoil out of the reach of the roots of the plants.

One of the greatest mistakes often made by newcomers on irrigation areas is in watering too heavily. On most of the irrigation settlements the regulations formulated by the governing authorities permit the individual irrigationist to use up to 24in. of water per acre per annum: but these regulations are not always enforced, with the result that inexperienced or careless irrigationists often put far more water on to their land than is good for it.

Seepage, the greatest foe the irrigationist has to fear, is more often brought about by excessive or careless watering than by any other means. Experience has shown that 24 acre inches each year is sufficient for vines and trees in full bearing, and that with good cultivation it is possible to obtain the heaviest crops with considerably less water than this.

Experiments in Irrigation.

To give a few practical illustrations of the results that may be obtained by an economical use of water combined with good cultivation, some experiments were conducted at my orchard, which is situated on the uplands of Berri, and the soil of which consists of sandy loam with a subsoil of calcareous marl. Young deciduous trees, consisting of peaches, nectarines, and pears, did not have their meter readings kept until their third year. Considering the irrigation season as commencing on July 1st, and extending until the end of the following June, these trees received the following amount of water:—1913-14 season—12in. of irrigation water per acre; rainfall during same period, 8½in.: total water received per acre, 20½in. 1914-15 season, 11½in. of irrigation water per acre; rainfall during same period, 5.3in.; total water received per acre, 16.8in. 1915-16 season—15in. of irrigation water per acre; rainfall during same period, 7.73in.; total water received per acre, 22.73in. The growth of the trees during these three years was good; but as the land later on developed alkali troubles in places, the trees were removed and the land planted with vines.

Owing to their evergreen nature, citrus trees require more water than most varieties of deciduous trees. For irrigation purposes, the citrus plantation was divided into two different sections, each section receiving different amounts of water. Meter readings were not kept until the trees were in their third year. Naming the two sections A and B, the irrigation records are as follows:—

SECTION A (FIVE ACRES).

Season.	Acre Inches of Irrigation Water Used.	Rainfall, July 1st to June 30th.	Total Water Received, in Acre Inches
1914-15	17	5.3	22.3
1915-16	18	7.73	25.73
1916-17	10	16.64	26.64
1917-18	13	13.57 (to May 16th)	26.57 (to May 16th)

SECTION B (FIVE ACRES).

1914-15	20	5.3	25.3
1915-16	24	7.73	31.73
1916 17	15	16.64	31.64
1917-18	21	13.57 (to May 16th)	34.57 (to May 16th)

Although during these four years section B received 80 acre inches of irrigation water, as against 58 acre inches received by section A, yet the growth and general health of the trees on both sections, as far as all appearances went, was identical. However, during the past season, as shown by the occasional wilting of some of the trees, it was evident that section A, with 13in. of irrigation water, had received the absolute minimum, lower than which it was not safe to go if the crop would not be lost. Such waterings as the amounts here recorded would, of course, only be applicable to young trees from two years to six years of age, as it is evident that mature trees require more water than this.

The argument is sometimes advanced by fruitgrowers that, although it is possible for young trees and vines to make satisfactory growth on small quantities of water, yet when these have reached maturity, and are carrying heavy crops, it is necessary to water very heavily to ensure the filling out of the fruit, and to make good fruiting wood for the next season. To test this point, experiments were carried out with bearing currant and sultana vines, the currants being situated on the highest part of the holding, on a sandy rise, with no irrigable land above them, and could therefore receive no water by seepage from other portions of the orchard. The irrigation results were as follow:—

CURRANTS.

Season	Crop Dried Fruit, Per Acre.	Acre Inches of Irrigation Water Used.	Rainfall, July 1st to June 30th.	Total Water Received, in Acre Inches
1913-14	16cwts.	15	8.5	23.5
1914-15	1 ton	14	5.3	19.3
1915-16	2¼ tons	18	7.73	25.73
1916-17	2½ tons	9	16.64	25.64
1917-18	2¼ tons	14	13.57 (to May 16th)	27.57 (to May 16th)

Sultanas situated just below the currant plantation received the same amount of water, and during the four years of 1915 to 1918 (inclusive) gave a yield of 1 ton, 1½ tons, 1¾ tons, and 1½ tons of dried fruit per acre respectively.

These figures seem to indicate that over a period of up to five years—the first three years of which were seasons of drought—that on sandy land, underlaid by the usual calcareous marl, it is possible to harvest the heaviest crops on less than 20in. of irrigation water per annum.

Irrigation Season.

In practice the irrigation season extends from August until about May in normal years. If the spring is wet or cool, the first two irrigations need only be light, and the heaviest waterings should be made during the hottest months, when the evaporation both through the foliage of the plants and from out of the ground is at its greatest; but they should also vary according to the different classes of fruit. Thus, for the filling out of their fruit, apricots should receive their heaviest watering at the end of November or early December; mid-season peaches in mid-December; currants and sultanas during December and January. Citrus trees should receive good waterings during the summer months, and are benefited by an April irrigation in the filling out of their fruit.

Perhaps some indication of how water may be applied with good results during a dry summer may be obtained from the perusal of the figures relating to the amount of water given to the vines before referred to during the 1915-16 season, which were:—September, 3in.; November, 3½in.; December, 6½in.; February, 5in.; making a total of 18in. for the season.

After the crop has been harvested, little, if any, water should be applied, as heavy waterings at this period force out late sappy growth, which, being useless as fruiting wood, has to be removed at the winter pruning. Apricots and mid-season peaches which ripen their fruit during the end of December and January may receive a moderate watering after their fruit is harvested, as the time from January to the following August is too long a period to be without water during a dry summer and autumn.

Cultivation.

So closely connected with irrigation as to be practically a part of it is the subject of cultivation. The irrigation of a piece of land is of little use unless it is followed by cultivation, as the water poured into the soil soon evaporates unless the surface of the ground is kept well stirred. Cultivation destroys the small capillary tubes along which the moisture passes through the soil into the atmosphere, and thus forming a blanket of loose, dry earth on top through which evaporation can only imperfectly take place, the lower layers of the soil are kept moist. Therefore a thorough cultivation of the orchard should follow every irrigation, after the ground has been allowed to dry a little so as not to puddle the soil, and should also take place after every rain of

any consequence. But the whole subject of cultivation is a big one, that to do it justice would require a separate paper, and all that can be done here is merely to emphasize its importance.

In conclusion, the art of good irrigation practice may be summed up in a few words—To attend carefully to the water while it is running along the furrows; not to over-water; to vary the quantities of water used according to the varieties of plants, and to the time and nature of the season; and to cultivate often and well.

Discussion.

The Director of Agriculture (Professor Arthur J. Perkins), in discussing the paper, congratulated Mr. Arndt on the very able paper he had prepared. That method of underground irrigation mentioned by the writer in his paper was one that he, personally, would be very chary of installing. One of the greatest drawbacks to that system was the cracking of the pipes. No matter how small the crack might be the small fibres of the roots of weeds and other plants would in time find their way into the pipe, with the result that a "foxtail" would form and cause a block in the pipe. In such a case, it would be necessary to tear up the ground to discover where the pipe was choked up. He had had experience with sprinklers known as "rainmakers," and was of the opinion that they used considerably more water than the furrow system of irrigation. The reason for that was because the atmosphere was like a large sponge, and absorbed large quantities of water, particularly in hot, dry, summer days, and he was under the impression that greater trouble with fungus diseases would be experienced during the warmer months of the year if that system were adopted. The difficulty of irrigating steep land would be overcome if they did not insist on laying out the orchards in straight lines. They should endeavor to follow the contour of the land, and thus avoid steep irrigation. That plan, he thought, could be practised to a greater extent in the laying out of new lands for orchard irrigation. The Director commended the writer on the importance he attached to tillage, and pointed out that the value of it could not be over-estimated, even under irrigation conditions. Irrigation should be looked upon as supplementing the work of tillage, and not the reverse. Mr. W. Francis (Waikerie) said one of the weak points of the system was that the land sunk under the pipe, thus causing the joint to crack. Mr. F. R. Goodchild (Waikerie) thought that if one met with an indentation in the land when laying down a system of underground irrigation, considerable expense would have to be incurred to make the ground level. He spoke of several cases that had occurred in Waikerie, where a leak in the joint had caused the pipe to sink and then crack. He suggested that the inlet channels should be made to convey the water away from the pipes, and not be allowed to bubble over, as was the case in many of the present systems.

POULTRY NOTES.

[By D. F. Laurie, Government Poultry Expert and Lecturer.]

COMMERCIAL BREEDS (continued).

The True Egg-laying Breeds.

Egg production, to be profitable, depends upon the strain or family of a breed more than on the breed itself. This point has been taken advantage of by those breeders who hope to combine in the one fowl the highest egg yield and the acme of perfection as a table bird producer. This is, of course, impossible. In a laying hen all the surplus food, *i.e.*, that which is not required for the upkeep of the body, is converted into eggs. A heavy layer cannot be a fat, heavy hen, because she cannot convert her surplus food into both flesh and eggs. From a modern point of view we may look upon the Mediterranean breeds (Leghorn, Minorca, Andalusian, and Ancona), as *the* layers pure and simple. Generally speaking, the laying breeds of this class are of a type common to the group. There is no doubt whatever that this general type has resulted from a long course of selective breeding. In the countries where these fowls were originally to be found eggs were in greater demand than meat; hence the gradual development of the laying type. No one of these breeds is a good table bird, notwithstanding the claims in favor of the Minorca, the largest of the group. The flesh is palatable, and in poor laying strains it is often very good.

Leghorns.—This breed is at present the most popular of all the light breeds, and solely through the wonderful egg production of the White variety. There are many varieties of Leghorn other than the White. They include the Black, the Duckwing, the Pile, the Buff, and the Cuckoo. All the varieties may be bred as a subgroup with rose combs. Generally the single comb predominates in all varieties, and particularly so in the Whites. Blacks were fashionable in England, and so were the Buffs, which came from Denmark with a big name. Browns are marked like Black Red Game, and are not brown at all. This variety has of late been neglected, but is likely one day to come to the front. The absurd show conditions requiring double mating practically ruined the Browns. Of the others there is little to be said from a utility point of view.

Although it had been taught by various writers that egg-production depended upon the breeding of a particular family or strain of fowls it was not until the results of laying competitions were seen that the "man in the street" as well as the average breeder, recognised the fact. In a list of 100 pens of Leghorns the final scores ranged from good to very indifferent. It was soon recognised that it was not a case of luck—it was definite proof that groups or pens of Leghorns and other fowls varied greatly in their capacity as layers. Later on the individual scores of the pullets in each pen entered were shown to vary very considerably, and so the value of the individual score was recognised.

The White Leghorn made new history, and established facts of the greatest importance. South Australian-bred White Leghorns had the honor of leading the way. It is safe to say that South Australian White Leghorns are responsible for the best scores at present being made in the other States, New Zealand, South Africa, and America. For many years White Leghorns have made these wonderful scores here and elsewhere. It will be a long time before any other breed can claim such a record.

To a certain extent some important points of the White Leghorn have been overlooked. It was originally seen as a small fowl, because the first specimens were from Italy, a country where poultry-breeding was neglected. The originals, as regards size, were then degenerates. In America, the great modern home of the White Leghorn, they are just awakening to the importance of fair size. In England, with the exception of Bantams, the practice seems to tend to oversize in all breeds. The English show White Leghorn of 10 years ago was nothing but a monstrosity. More recently they are approximating the South Australian type and size.

White Leghorns should be of good size, because the small ones, although good layers have not the constitution necessary in a continuous layer, and the additional pound weight first recommended by the writer makes for constitution, and adds to value in the meat market. The combs of both sexes should be single, and quite free from side sprigs. These are unnecessary deformities, and should not be tolerated. The color of the eye should be reddish; pale or light-colored eyes denote poor constitution. There should be no colored feathers in the plumage. Although some of the best strains throw a percentage of chickens with colored feathers (nearly always red or pile) that is not a sign of foreign blood, but is due to color factors; an interesting point for which there is no space here for an explanation. The legs of young birds in both sexes should be distinctly yellow. In the male birds the outer side of the shank should be reddish orange. In good layers the legs generally become pale, and soon lose color. The color is due to loosely-combined pigment. The writer has a preference for long sweeping backs, broad shoulders, and great depth of body in the hens, *i.e.*, behind the line of the legs. In the male bird flowing neck and saddle hackles and a large tail denote the laying type. The tail of the hen should be fan shaped, not clipped tightly like that of a game hen.

The Minorca is generally seen in the one variety, the black-whites are seldom seen nowadays. This is a much larger fowl than the Leghorn. Those seen at shows have generally a beetle-green sheen in the plumage, but the proper color of the original birds was rook black, very dense and brilliant. In young birds the legs are black, but they become slaty in older birds. Minorcas lay very large eggs, but good laying strains are conspicuous by their absence. There are some half-bred Minorca-Hamburgs to be seen—these lay well, but then they are small and are not Minorcas.

The Andalusian is larger than the Leghorn, but smaller than the Minorca. It is a good layer, and a good strain could be built up, but the colors would be various. A pair of pale-blue Andalusians when

mated, would, if 100 chickens were hatched, produce on the average 50 blue ones, 25 blacks, and 25 splashed whites. The heredity of color in Andalusians is of historic interest. The real difficulties which beset the breeder account for the lack of popularity of this breed.

The Ancona as generally seen is a smaller breed than the Leghorn. The color is mottled black and white, and the shanks are the same. (This is one distinction between the Ancona and the Cuckoo Leghorn which has yellow legs and feet.) In America the Anconas are being bred much larger. They are at present somewhat wild, and have nothing to particularly recommend them.

General Notes.

Mate up the light breeds. The general purpose or heavy breeds should now be producing plenty of sittings. Do not hatch heavy breeds on the Murray or in the North later than the middle of September. Light breeds should all be hatched by the first week in October at the very latest. Late-hatched chickens are seldom worth rearing. This question has been thoroughly tested for years at the poultry stations.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on June 12th, there being present Mr. Geo. Jeffrey (chairman), Prof. Arthur J. Perkins, Messrs. A. M. Dawkins, C. J. Tuckwell, G. R. Laffer, M.P., F. Coleman, T. H. Williams, A. W. Shillabeer, and H. J. Finnis (Acting Secretary). Apologies were received from Messrs. J. Miller, W. J. Colebatch, and Col. J. Rowell, C.B.

A report was received from the Wheat Harvest Board in response to the Board's request that investigations should be made in respect of the alleged shortage of bran in South Australia.

Neglected Orchards.

The Blackwood Branch of the Agricultural Bureau had suggested that the Government should take action to compel owners of neglected orchards either to spray the trees or cut them out, or, if necessary, the Government should do the spraying and charge the cost to the owners. A report on the question was received from the Horticultural Instructor (Mr. Geo. Quinn), and after consideration, the Board decided that it could not see its way clear to recommend action in the direction suggested.

Horticultural Experiments.

On the suggestion of the Lenswood and Forest Range Branch that one of the horticultural instructors should be set aside to carry out experiments, the Horticultural Instructor (Mr. Geo. Quinn) reported—"Whilst the spirit of the resolution has my hearty support, I scarcely consider it a practicable suggestion. Since the orchard inspectors have been given an improved status, a part of the duty assigned to them takes the direction indicated by this resolution. Each officer has been encouraged to bring forward proposals for carrying out field trials bearing upon local problems which confront the fruitgrowers in his particular district. Already trials are in operation with a view to minimising the damage done by shothole fungi in the cherry trees in the Mount Lofty Ranges, whilst in the Barossa district trials against the black spot of the grape vine have been commenced. Further tests of various systems of pruning and fertilizing are being formulated with a view to trying to secure more regular crops on certain kinds of fruit trees. I am of the opinion that, whilst this method will not be so costly as that suggested by the resolution, it will give equal if not superior results owing to the local knowledge possessed by the instructor, who has familiarized himself with the conditions of climate, soil, and horticultural practice prevailing in the neighborhood."

Compulsory Dipping of Sheep.

It was decided to ask the Government to express as early as possible, its attitude towards the compulsory dipping of sheep, as it was felt desirable that the intention of the Government in regard to this question should be made known at the earliest possible moment.

Sewing of Super. Bags.

Complaints were received in regard to the manner in which bags containing superphosphate were sewn, and the Board decided to bring the matter under the notice of the firms concerned.

Protection of Wheat Stacks.

The Wepowie Branch of the Agricultural Bureau had intimated that they had appointed a committee to inspect and report on the condition and protection of wheat stacks in its district. The Board suggested that the Government should invite Branches of the Agricultural Bureau to appoint Vigilance Committees for the purpose of inspecting stacks and rendering any assistance within their power to protect the wheat.

Resolutions from Murray River Conference.

1. "That this Conference desires to express its appreciation of the work now being done at Berri Experimental Orchard, and requests the Government to extend the scope of its operation as far as possible, and that experiments be conducted with new varieties of plants and grasses suitable for the irrigation areas of the Murray." This was transmitted to the Minister of Agriculture with an intimation that it had the support of the Board.

2. "That the Minister of Agriculture should be empowered, on receipt of a request made by a duly-convened public meeting of vine-growers on any area, to declare such district an area infected with anthracnose, and to make the proper treatment on vines in the said area compulsory." This was transmitted to the Minister of Agriculture.

3. "That this Conference of Murray River Branches supports the action of the Advisory Board in its endeavors to secure legislation to provide that seeds from neighboring States should be subjected to the same conditions of inspection as were imposed on those from overseas." This was transmitted to the Minister of Agriculture.

4. "That the Government be asked to supply a boring plant for the use of the settlers on the irrigation areas." This was transmitted to the Minister of Agriculture with an intimation to the effect that the Board did not feel disposed in recommending that the Conference wishes should be carried out.

5. It was decided to ask the Government to ascertain from the Crown Law Department the possibility of fruitgrowers obtaining compensation from nurserymen who supplied fruit trees not true to name.

Life Member.

The name of Mr. J. Paterson, of Cradock was added to the list of life members of the Agricultural Bureau.

New Members.

The following names were added to the rolls of existing Branches:—Monarto South—C. O. Harper, H. G. Patterson; Salisbury—H. Griffiths; Glencoe—S. W. McRostie; Wynarka—F. Alms; Miltalie—H. Degner; Leighton—J. Flower; Strathalbyn—S. Bottrill, W. Saunders, S. Saunders, G. R. Donaldson, Chas. Griffin; Pompoota—H. C. McPhee, J. Haskell, F. Munro, J. P. Blake, Q. G. McMicking, J. Patterson, A. R. G. Fletcher, T. A. Cowin, W. Hese, F. Gill, E. W. Johnson, H. C. Jorgensen, W. Brydin; Beetaloo Valley—S. C. Billinghurst; Mount Barker—A. Chapman, G. Jacobs, W. J. McCloy; Milang—S. R. Holman, N. Howard; Inman Valley—J. M. Grosvenor, C. Thompson, E. Lusk, M. Martin; Clarendon—H. L. Frisby; Lameroo—E. J. Walter, J. Feinler; Kybybolite—A. McLean; Brentwood—E. J. Haywood; Naracoorte—A. H. Middleton, J. Fordham, P. J. Edwards; Belalie North—O. Zelm; Saddleworth—J. B. Coombe; Blackwood—R. Fowler, S. W. Chapman, Wm. Liddle; Tantanoola—W. Whan; Wudinna—John O'Connor, Wm. Spiers, T. Butterfield, F. Allen, S. Mitchell, F. L. Johnson, S. Knight, Wm. Blucher, A. A. Knight, J. H. Butterfield, M. Burke, H. Byrne, E. J. Barnes, A. R. Johnson, Jas. Rorke, Pat. Daly; Murray Bridge—F. Work, A. Medwell, A. Jaensch, W. George, P. Hutchison; Cummins—T. Bailey, W. H. Dyke; Millicent—D. Hannaford; Redhill—W. Wake; Minnipa—H. E. Elefson, E. E. Elefson; Yaninee—J. Hissey, J. Carey, H. Parker, L. Parker; Bookpurnong East—H. M. Jones, A. A. Jones, T. Obst, M. Obst.

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on July 1st:—

BUTTER.—The rain recorded in June has been somewhat patchy, the southern districts suffering most. However, a good increase in local supplies of butter has been noticeable, which is not only appreciated by the dairy farmers, but by the trade generally. There are still some odd lots of imported on this market, but in a week or two South Australia should be self-supporting, and it should not be long before we have quantities for export. Already negotiations are being entered into with the Imperial Government for the purchase of our surplus for next season, so that all interested in the dairying industry are anxiously awaiting the result. Values have eased, and at the close of the month "Alfa" was selling at 1s. 6d.; "Primus," 1s. 5½d.; second grade factory, 1s. 3½d.; third grade, 1s. 2½d.; choice separators and dairies, 1s. 4d. to 1s. 5d.; fair quality, 1s. 3d. to 1s. 3½d.; store and collectors', 1s. 2d. to 1s. 3d. per lb.

EGGS.—Values have kept up wonderfully well during the month, present prices being considerably higher than at the corresponding time last year. Forwardings are showing a seasonable increase, and lower prices are looked for in the near future. Refrigerated and well-preserved lots have found rather slow sale. Quotations are:—Fresh hen, 1s. 3d.; duck, 1s. 4d.; refrigerated, 1s. to 1s. 1d.; well preserved, 10½d. per dozen.

CHEESE.—Supplies coming from the South-East have been hardly equal to trade requirements. All consignments have been readily cleared at proclaimed prices—Matured, 1s. to 1s. 0½d.; new make, 10d. to 10½d. per lb. for large to loaf.

HONEY.—Market has been fairly active, although large quantities have been held by speculators awaiting shipment. Prime clear extracted, 4½d. to 5d.; second grades slow at 3d. to 3½d.; beeswax wanted at 2s. 1d. per lb.

ALMONDS.—Last season's are practically cleared, only odd lots arriving, which are readily saleable at—Brandis, 1s. 4d.; mixed softshells, 1s. 3d.; hardshells, 10d.; kernels, 2s. per lb.

BACON.—After many weeks of dull markets, an improvement has taken place the last few days, with values ruling a shade firmer. Best factory-cured sides, 10½d. to 11d.; hams, 11d. to 1s. per lb.

LIVE POULTRY.—It is pleasing to report that very brisk markets have ruled throughout the month, and although heavy quantities came forward, prices well maintained. Heavy-weight table roosters, 3s. 6d. to 4s. 6d. each; nice-conditioned cockerels, 2s. 9d. to 3s. 4d.; plump hens, 2s. 3d. to 3s. 6d.; light birds, 1s. 9d. to 2s.; ducks, 1s. 11d. to 3s. 6d.; geese, 4s. 4d. to 5s.; pigeons, 4½d. to 5d. each; turkeys, from 8d. to 10d. per lb. live weight for fair to good table birds; fattening sorts, 7d. to 7½d. per lb. The first of a series of purebred and fancy poultry sales was held on June 26th, the catalogue being an extensive one, which attracted a good attendance of purchasers, and good prices ruled where condition and breeding were right.

POTATOES.—The South-Eastern potato crop this year may now be definitely described as a failure, and Adelaide buyers during the past few weeks have purchased from Victoria much more freely than heretofore. The crops at Ballarat, however, seem to be much heavier than usual, and the increased demand from this State does not appear to have made any impression to speak of in the Victorian market.

ONIONS.—Growers both in Mount Gambier and Victoria are parting with supplies most grudgingly, and prices have advanced. Quotations—Potatoes, £5 to £5 10s. per ton on trucks Mile End or Port Adelaide. Onions, £16 to £17 per ton on rails Mile End or Port Adelaide.

THE AGRICULTURAL OUTLOOK.

REPORTS FOR THE MONTH OF JUNE.

The following reports on the general Agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers.—

Booborowie.—The weather has been perfect for this month, nice showers have fallen at intervals, and the majority of the days have been bright and clear. A few frosts have been experienced. Crops—The seeding is practically finished, only a few small blocks remain to be sown. The wheat is coming away, and some of the early sown has covered the ground. Natural Feed—This has been one of the best years for early green feed known to old residents. Stock—Horses have been suffering from colds and various other troubles; these occuring during seeding made the majority of horse stock look rather rough. Pests—Rabbits are still numerous. Miscellaneous—The crops have been put in under better conditions and with greater care than is often the case; the result at harvest should be noticeable.

Eyre's Peninsula.—The weather on the whole has been fine and calm, interspersed with light showery conditions. Over 40 points of rain fell at the commencement of the month, otherwise rains were light. About 130 points have been registered in all for the month—quite the lowest record for the past four Junes, and nearly an inch below the average. Crops—Most of the crops have germinated well, and are growing steadily, especially those on fallow land. Natural Feed—Young growth is becoming plentiful. Pests—The rabbits are increasing in numbers; traps are now much in use.

Kybybolite.—The weather has been seasonable, 3in. of rain being registered, but excessive wet conditions have not prevailed, the rain falling in showers, distributed over the greater portion of the month. Crops—Seeding operations in so far as wheat and oats are concerned, has ceased; barley and peas have yet to be sown. The area under the first-mentioned cereals is considerably under that of recent years, mainly the effect of the bad cropping experiences of last season. All crops up have started exceedingly well, and are in perfectly healthy condition. Feeding of early sown crops is general. Natural feed is plentiful; there has been more growth than in ordinary seasons, although the first rains were rather late; the reason is found in the exceedingly mild winter conditions so far experienced. Stock have rapidly improved since new feed has become plentiful; lambing is finished, and fair percentages obtained; losses were increased through the poor condition of ewes in the early stages and the ravages of foxes. Pests—The fox has given a good deal of trouble to some farmers; unfortunately, those who make provision for an early lambing almost invariably suffer heavily in this respect.

Turretfield.—The weather during June was ideal from an agricultural point of view, bright sunshine alternating with moderate falls of rain. Seeding conditions could not have been more favorable, and the rainfall was sufficient for all immediate purposes. The total gauged for the month was 193 points. Three or four fairly heavy frosts were experienced. Crops—In all crops that have had time to appear above ground the germination has been excellent, and the young plants are looking healthy, and are of good color. Natural feed has made good headway, and there is now ample green feed for stock. Stock—A few fatalities have been reported among sheep, but otherwise all stock have been doing well. Lambs are looking particularly well. Pests—Sparrows are reported to be doing damage to some of the young crops. Miscellaneous—Fallowing operations are in full swing, and the ground is turning up well.

Yeitch.—Weather—Very light rains have fallen up to date. The surrounding country needs a good soaking rain to bring along feed and crops. Crops—All crops are showing a healthy color, especially the early sown areas. A good deal of rubbish is showing in the old land. Natural Feed—Short, but enough to keep stock going. Stock—All in healthy condition. Pests—Rabbits are doing a good deal of damage to crops generally.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of June, 1918, also the average precipitation to the end of June, 1918, and the average annual rainfall.

Station.	For June, 1918.	To end June, 1918.	Av'ge. to end June.	Av'ge. Annual Rainfall
Far North and Upper North.				
Oodnadatta	0·06	1·37	2·93	4·76
Tarcoola	1·04	4·80	3·08	7·58
Marree	0·35	4·38	2·62	6·04
Farina	0·34	4·24	3·62	6·70
Leigh's Creek	0·29	3·36	4·60	8·66
Beltana	0·53	3·91	4·86	9·22
Blinman	0·67	5·20	6·66	12·83
Hookina	1·55	6·23	5·34	—
Hawker	1·34	5·80	5·77	12·22
Wilson	1·94	6·77	5·59	11·78
Gordon	1·86	7·91	5·26	10·26
Quorn	1·99	7·06	5·97	13·78
Port Augusta	0·89	3·98	4·67	9·46
Port Augusta W.	0·94	4·54	4·40	9·36
Bruce	1·02	4·21	4·30	10·01
Hammond	1·16	4·42	5·14	11·46
Wilmington	2·04	7·17	8·20	18·26
Willowie	1·01	4·32	5·20	11·90
Melrose	2·61	9·51	10·73	23·04
Booleroo Centre	1·22	6·48	6·94	15·83
Port Germein	0·99	6·16	6·08	12·84
Wirrabara	2·31	7·77	8·63	18·91
Appila	1·09	5·56	6·69	15·08
Cradock	1·77	5·83	5·07	10·86
Carrieton	1·48	6·78	5·47	12·22
Johnburg	1·12	5·74	4·90	10·21
Eurelia	0·65	5·33	5·85	13·24
Orroroo	1·08	5·81	6·33	13·42
Black Rock	1·00	5·79	5·72	12·25
Peterborough	0·80	5·87	5·95	13·07
Yongala	1·20	6·32	5·87	13·94
North-East.				
Ucolta	0·56	6·01	3·82	—
Nackara	0·74	7·27	4·60	—
Yunta	0·40	6·50	4·04	8·22
Waukaringa	1·26	5·92	3·88	7·94
Mannahill	1·47	7·08	4·09	8·46
Cockburn	0·55	6·94	4·04	7·97
Broken Hill, NSW	0·39	6·26	4·78	9·63
Lower North.				
Port Pirie	1·14	5·48	6·43	13·21
Port Broughton	0·97	3·93	6·83	14·33
Bute	1·33	5·36	7·21	15·42
Laura	1·76	5·72	7·89	18·22
Caltowie	1·46	6·69	6·91	17·27
Jamestown	1·86	7·45	7·46	17·46
Gladstone	1·49	7·29	7·00	16·00
Crystal Brook	1·66	8·28	7·13	15·62
Georgetown	1·65	7·63	8·25	18·32
Narridy	0·81	5·31	7·60	16·79
Redhill	1·88	6·45	7·71	16·79
Lower North—*continued*.				
Spalding	2·24	8·99	8·35	20·25
Gulnare	2·35	8·58	7·67	19·74
Bundaleer W. Wks.	1·83	8·74	5·87	17·29
Yacka	1·63	6·27	7·15	15·27
Koolunga	1·34	5·35	7·18	15·94
Snowtown	1·69	4·65	7·31	15·70
Brinkworth	1·82	7·45	6·98	15·48
Blyth	1·73	7·30	7·65	16·34
Clare	2·56	9·74	11·02	24·30
Mintaro	3·49	10·28	9·82	21·99
Watervale	2·93	10·16	12·41	27·17
Auburn	2·84	9·33	10·99	24·25
Hoyleton	1·50	5·79	8·19	17·96
Balaklava	1·16	7·06	7·43	16·03
Port Wakefield	1·00	4·41	6·55	13·13
Terowie	1·02	5·40	5·84	13·71
Yarcowie	1·11	7 17	6·16	13·91
Hallett	1·44	5·94	6·94	16·40
Mount Bryan	1·60	5·89	6·69	15·73
Burra	2·07	7·17	8·01	17·82
Farrell's Flat	1·86	6·77	8·45	18·87
West of Murray Range.				
Manoora	1·89	8·58	8·02	18·09
Saddleworth	1·88	7·84	9·08	19·69
Marrabel	1·90	8·55	8·64	18·94
Riverton	1·70	7·73	9·47	20·48
Tarlee	1·46	6·85	7·18	17·48
Stockport	1·18	5·26	7·45	15·89
Hamley Bridge	1·35	5·53	7·77	16·45
Kapunda	1·75	7·26	9·06	19·67
Freeling	1·45	6·46	8·24	17·85
Greenock	2·37	8·42	9·67	21·46
Truro	1·81	9·39	9·87	19·74
Stockwell	1·93	9·44	8·86	20·30
Nuriootpa	2·14	8·26	9·46	21·25
Angaston	2·22	10·14	10·02	22·25
Tanunda	2·19	8·29	10·11	22·28
Lyndoch	2·79	7·63	10·25	23·01
Williamstown	3·14	9·21	12·88	—
Adelaide Plains.				
Mallala	1·62	5·68	7·89	16·88
Roseworthy	1·79	6·95	8·21	17·31
Gawler	1·67	5·27	9·12	19·21
Two Wells	0·80	4·10	7·85	16·36
Virginia	1·44	5·32	8·36	17·58
Smithfield	1·50	5·14	8·29	17·30
Salisbury	1·99	7·57	9·00	18·57
North Adelaide	3·37	9·33	10·32	21·49
Adelaide	2·71	8·03	10·07	21·04
Brighton	3·68	10·20	9·98	—
Glenelg	2·42	6·69	8·07	—
Magill	3·04	9·23	12·41	19·93

RAINFALL—*continued.*

Station.	For June, 1918.	To end June, 1918	Av'ge. to end June.	Av'ge. Annual Rainfall
ADELAIDE PLAINS—*continued.*				
Glen Osmond	3·83	10·74	12·36	25·26
Mitcham	3·08	8·92	11·33	23·47
Belair	4·88	11·63	13·92	28·64
MOUNT LOFTY RANGES.				
Teatree Gully....	3·61	10·92	13·51	28·19
Stirling West	8·25	17·76	21·90	46·70
Uraidla	7·28	16·51	21·06	44·35
Clarendon	3·46	10·29	15·71	33·67
Morphett Vale ..	2·73	8·03	10·85	23·32
Noarlunga	1·94	6·18	9·60	20·28
Willunga	3·53	10·10	12·09	25·93
Aldinga	2·48	7·25	9·56	20·34
Normanville	2·21	6·19	9·38	20·65
Yankalilla.....	2·80	7·60	11·27	22·78
Cape Jervis	—	—	7·58	16·34
Mount Pleasant .	3·96	9·16	12·22	26·87
Birdwood	5·81	11·36	13·40	29·38
Gumeracha	5·25	13·48	15·28	33·30
Tweedvale	6·18	13·77	16·14	35·38
Woodside	5·52	13·85	14·24	31·87
Ambleside	5·10	12·02	15·49	35·45
Nairne	3·49	10·61	13·01	28·83
Mount Barker ...	4·27	13·00	13·88	30·93
Echunga	4·77	14·46	15·38	32·83
Macclesfield	4·21	12·67	13·54	30·72
Meadows	6·47	17·81	17·47	35·52
Strathalbyn	1·44	7·08	8·84	19·28
Myponga.....	2·85	9·38	—	—
Millbrook Reservr.	4·77	13·74	—	—
MURRAY FLATS AND VALLEY.				
Wellington	0·77	3·47	7·04	15·01
Milang	1·17	5·12	7·51	16·08
Langhorne's Brdg	0·51	2·94	6·70	15·27
Tailem Bend	0·78	5·10	6·51	—
Murray Bridge ..	0·50	3·81	6·64	14·32
Callington	0·97	4·19	7·20	15·65
Mannum	0·87	4·10	5·67	11·67
Palmer	1·23	4·37	6·71	15·60
Sedan	0·29	4·18	5·71	11·92
Blanchetown	—	3·54	5·04	—
Eudunda.....	0·92	7·75	7·81	17·33
Sutherlands	0·29	5·03	4·68	10·71
Morgan	0·10	3·30	4·16	10·60
Overland Corner .	0·57	3·35	5·24	—
Renmark	0·53	6·01	4·75	11·42
Loxton	0·53	4·24	4·34	10·93
Swan Reach	0·32	3·20	4·84	—
Waikerie.....	0·43	4·46	4·15	—
WEST OF SPENCER'S GULF.				
Eucla.....	0·47	5·08	5·60	10·13
White Well.....	0·81	3·17	4·43	9·67
Fowler's Bay ...	1·29	4·08	6·28	12·13
Penong	1·50	4·22	6·08	11·91
Murat Bay	1·37	3·73	4·41	—
Smoky Bay	1·71	4·27	—	—
Streaky Bay.....	1·72	4·51	7·47	16·31

Station.	For June, 1918.	To end June, 1918.	Av'ge. to end June.	Av'ge. Annual Rainfall
WEST OF SPENCER'S GULF—*continued.*				
Talia	1·53	4·37	6·17	—
Port Elliston	1·93	5·05	7·86	16·49
Port Lincoln	2·58	6·32	9·27	19·88
Tumby Bay	1·35	4·24	6·16	15·06
Carrow	0·68	2·92	—	—
Cowell	0·27	2·75	6·70	11·76
Point Lowly.....	0·46	3·63	5·30	12·21
Cummins	2·44	5·60	—	—
Arno Bay	0·69	2·57	5·97	—
YORKE'S PENINSULA.				
Wallaroo.....	0·82	5·07	7·24	14·05
Kadina	1·21	5·84	7·75	15·68
Moonta	0·79	5·09	8·71	15·22
Green's Plains ...	1·36	6·09	7·34	15·73
Maitland	2·25	6·79	9·63	20·08
Ardrossan	1·59	5·04	6·70	13·89
Port Victoria ...	1·83	5·51	7·50	15·21
Curramulka	1·70	4·83	8·47	18·50
Minlaton	1·72	5·64	8·32	17·41
Stansbury	1·57	3·77	7·94	17·08
Warooka	2·09	5·77	8·08	17·71
Yorketown	1·40	5·11	7·50	17·47
Edithburgh.....	2·37	5·93	7·93	16·48
SOUTH AND SOUTH-EAST.				
Cape Borda	4·63	9·28	12·08	25·09
Kingscote	2·43	7·00	8·84	18·96
Penneshaw	2·50	5·84	10·11	21·34
Cape Willoughby..	—	—	8·89	19·66
Victor Harbor ...	2·47	7·21	10·07	22·18
Port Elliot	1·88	7·27	9·35	20·33
Goolwa	1·69	5·45	8·41	17·93
Pinnaroo	1·82	7·42	6·74	16·74
Parilla	1·53	6·90	—	—
Lameroo	1·53	7·87	7·13	16·65
Parrakie	1·66	5·48	6·13	—
Geranium	1·81	5·98	7·08	—
Peake	1·37	5·01	7·30	—
Cooke's Plains ...	1·61	5·97	6·77	14·74
Meningie	2·55	7·00	8·72	—
Coomandook	2·06	7·00	7·82	16·80
Coonalpyn	3·04	7·52	7·74	17·49
Tintinara	3·67	9·41	8·27	18·78
Keith.....	2·11	6·84	8·05	—
Bordertown	2·69	7·91	8·53	19·76
Wolseley	2·69	8·52	6·91	17·72
Frances.....	2·56	7·86	5·52	20·74
Naracoorte	3·37	7·83	10·55	22·60
Penola	4·43	9·49	11·76	26·78
Lucindale	4·07	9·22	10·22	23·32
Kingston.....	3·81	8·66	11·53	24·73
Robe	6·87	10·59	11·37	24·69
Beachport.....	6·14	11·04	13·00	27 51
Millicent	4·85	10·97	13·48	29·25
Mount Gambier ..	5·37	11·34	14·14	32·00
C. Nrthumberland	—	—	—	26·63
Kalangadoo	5·51	11·24	—	—

AGRICULTURAL BUREAU REPORTS.

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Branch.	Report on Page	Dates of Meetings. July.	Aug.
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Balaklava	*	—	—
Beaufort	*	—	—
Beetaloo Valley	*	22	19
Belalie North	981-6	20	17
Berri	1011	24	21
Blackheath	†	20	17
Blackwood	1012	15	19
Blyth	981	—	—
Bookpurnong East	†	20	17
Booleroo Centre	982	19	16
Borrika	*	—	—
Bowhill	*	—	—
Brentwood	994	18	22
Brinkley	1000-1	—	—
Bundaleer Springs	982	—	—
Burra	*	—	—
Bute	995	—	—
Butler	996	—	—
Caltowie	*	—	—
Canowie Belt	§	—	—
Carrieton	*	24	21
Carrow	1000	18	22
Cherry Gardens	‡	23	20
Clanfield	1001	—	—
Clare	986	—	—
Clarendon	1013	22	—
Claypan Bore	1002	22	19
Colton	*	—	—
Coomandook	1011	—	—
Coomooroo	*	—	—
Coonalpyn	*	—	—
Coonawarra	1017	—	—
Coorabie	*	—	—
Cradock	981	—	—
Crystal Brook	*	—	—
Cummins	*	27	24
Cygnet River	1016	18	22
Dawson	*	—	—
Denial Bay	*	—	—
Dowlingville	*	—	—
Edillilie	986	—	—
Elbow Hill	*	—	—
Eurelia	979	20	24
Forster	*	—	—
Frances	*	—	—
Freeling	*	17	22
Gawler River	994	22	19
Georgetown	*	—	—
Geranium	1003	27	31
Gladstone	982	—	—
Glencoe	*	—	—
Glencope	*	—	—
Goode	*	—	—
Green Patch	*	—	—
Gumeracha	*	—	—
Halidon	*	—	—
Hartley	1014	24	21
Hawker	*	25	22
Hilltown	*	—	—
Hookina	979	23	20
Inman Valley	1014	—	—
Ironbank	§	—	—
Julia	*	—	—
Kadina	*	13	10
Kalangadoo	*	—	—
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Keith	*	—	—
Ki Ki	1003	—	—
Kingscote	*	—	—
Kingston-on-Murray	†	—	—
Kongorong	1018	23	20
Koonibba	996	18	20
Koppio	997	2	6
Kybybolite	*	18	15
Lameroo	*	—	—
Laura	983	12	—
Leighton	984	18	—
Lenswood and Forest Range	+	—	—
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THE AGRICULTURAL BUREAU.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

EURELIA.

June 22nd.—Present: eight members.

GARDENING ON THE FARM.—In a short paper on this subject, Mr. E. P. Wall said every farmer should endeavor to have a vegetable garden, in which enough vegetables should be grown for the use of the house. An amateur could succeed in growing first-class vegetables, but it was not advisable to grow too many varieties until one gained a little experience. The chief vegetables that grew well in that district were cabbages, cauliflowers, lettuces, carrots, parsnips, radishes, turnips, onions, peas, tomatoes, and melons. The garden should contain about 150 cabbages, 50 cauliflowers, and 60 lettuces, a few rows of onions, carrots, and parsnips, and plots of turnips, peas, and radishes according to requirements. All of those would do well in the winter months, and required very little labor after they had commenced to grow. It was always advisable to obtain a fresh supply of seeds each year, because the old seeds did not germinate as quickly as the new ones.

HOOKINA (Average annual rainfall, 12in.).

May 21st.—Present: seven members.

APICULTURE.—Under this title a short paper was contributed by Mr. B. Sheridon. On every farm, he said, there should be a few swarms of bees kept in a sheltered spot. During the warm days of spring all the colonies should be inspected, and all broods and stores equalized. To ensure a successful season each colony should consist of 40,000 to 50,000 workers, and every precaution should be taken to prevent swarming, in order that a good supply of honey might be secured. When the brood chamber was full of bees, and the honey commenced to flow, a queen excluder should be placed over the brood nest, and over that a super of empty extracting combs. When the main honey flow had properly set in, and the colonies were in good condition, a second super should be put on before the first one became overcrowded, and before the queen cells were started. No honey should be extracted until refined by the bees. Mr. T. Tulloch also read a paper on "Colt-breaking."

MORCHARD (Average annual rainfall, 11in. to 12in.).

May 25th.—Present: 13 members and one visitor.

DAIRYING ON THE FARM.—Mr. H. A. Tilbrook, in a paper on the question of farm dairying, said that properly cared for, cows were one of the best side lines on the farm. Only good stock should be kept, and if the farmer wished to find out those cows that were not bringing in a profit, he should make a standard, and get rid of those cows that were not paying for their food. If the best results were desired, the cows should be properly fed with good green feed when available, and given a plentiful supply of bran during the dry season of the year. Milking should be done quietly and quickly, and every drop of milk taken from the cow's udder, or she would gradually give less milk, and possibly dry off altogether. All buckets and utensils used in the handling of the milk and cream should be kept clean, and the milk strained before separating. The separator should stand firm and level,

and for a clean skimming the machine should be run at the correct speed. He spoke against the practice of adding preservatives to the produce, and thought the cream should be sent to the factory as often as possible. In the discussion that followed the reading of the paper, Mr. B. S. McCallum thought the cow was the best side line to keep on a small farm, because it was not necessary to have sheep-proof fences. Lucerne, he considered, was the best feed for the cow, and wherever sufficient water was available, a plot of it should be planted. Mr. W. Toop did not think dairying on the farm would pay, unless the members of one's own household could do the work. Mr. R. Jasper spoke in favor of the dairy cow on the small farm, and thought that where the rainfall was good, summer and autumn fodders should be grown for the cattle.

QUORN (Average annual rainfall, 13.78in.).

June 21st.—Present: eight members and one visitor.

ASSISTING THE WHEAT POOL.—The Hon. Secretary (Mr. C. Patten), in a paper on this subject, said the formation of local committees, as suggested in the papers some time ago, was one that the farmers in every district should consider very seriously. The forming of such committees would enable the Government to dispense with the services of the inspectors, and it was their duty to do all in their power to assist the Government as much as possible in the handling of the grain of the State.—Mr. Noll, on behalf of the Branch, presented to Mr. Thompson, the Chairman, and to Mr. C. Patten, the Hon. Secretary, a life membership certificate for 20 years of active work in connection with the work of the Bureau.

TARCOWIE (Average annual rainfall, about 15½in.).

May 21st.—Present: 16 members and one visitor.

THE VALUE OF SHEEP ON THE FARM.—Mr. C. A. Kotz, in a paper on this subject, said few farmers seemed to realize the value of sheep on the land, or they would endeavor to keep them in larger numbers on their holdings. He realized that just at the present time it was very difficult for anyone just commencing farming to take up sheep in any large numbers, but he thought they should purchase a few good Merino ewes about August. His reason for giving that particular date was because the shearing season would soon take place, and the price received for the wool would go a long way towards the initial cost of the ewes. The general rule in that district was to put the rams with the ewes about November, so that they would lamb during March. He considered that a mistake, because during the months of March, April, and May there was very little green feed about for the young lambs. It would be much better if the ewes were to lamb during August, because the worst of the winter weather would be over, and there would be an abundance of green feed about for the ewes and the lambs; but care should be taken that the ewes did not lamb during shearing operations. He favored the Lincoln or Romney Marsh ram mated with the Merino ewe, because that would produce a sheep with wool of a long staple and a large carcass. Mr. Symonds, in opening the discussion, said the ewes should commence to lamb in May, because one would then be able to shear the lambs at shearing time. Mr. D. Smith was of the opinion that it did not pay to feed sheep during a dry season, because the return from them would not pay for the expense of purchasing the chaff and corn. Mr. Edwards favored the month of May for the lambing period, because if it were any later the ewes would not be in good condition when the feed was dry. He also gave preference to the pure-bred Merino, because of the very fine quality of the wool it produced.

WILMINGTON (Average annual rainfall, 18.26in.).

May 22nd.—Present: 16 members.

HARROWING GROWING CROPS.—Mr. Stephens, in reading a paper on this question, considered the practice of harrowing growing crops a most progressive idea. After the crop had been above the ground for about a month the harrows could be run over the land across the drill marks. It was also advisable to harrow after a good rain, but the land should be allowed to dry off a little, so that it would carry the horses. He had found a difference of from 3bush. to 4bush. on the land that had been worked with the harrows compared with that not so treated. Should only a light rain fall the land should not be touched, or a number of the wheat plants would be destroyed. In the discussion that followed Messrs. Hannagan, Goodenough, and W. Schuppan expressed opinions that the harrows should be used

freely on crops of wheat, the plants of which had rooted firmly. Care should, however, be exercised to harrow after a fair rain only. Other speakers agreed with the principle of harrowing crops to assist in the growth. Messrs. Cole and Duhring strongly contended that where the plant appeared to come through the ground well, it should not be interfered with.

AMYTON, May 21st.—The evening was devoted to the discussion of the proceedings of the recent Conference of Upper Northern Branches of the Agricultural Bureau, held at Orroroo.

CRADOCK, May 25th.—The meeting discussed at length the question of "The Stability of Strychnine in Poisoned Rabbits."

MOUNT REMARKABLE, May 15th.—The Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) delivered an address on "Stinkwort and its Effect on Sheep."

MOUNT REMARKABLE, June 5th.—The Poultry Expert (Mr. D. F. Laurie) attended the meeting and gave a lecture, illustrated with lantern slides, on "Parasites of Poultry."

QUORN, May 24th.—The Chairman (Mr. Noll) read two extracts from the *Journal*, and the report of the delegates to the recent Conference at Orroroo was received.

TARCOWIE, June 18th.—The Hon. Secretary (Mr. W. S. Ninnes) read the annual report, and the election of officers followed. The meeting then discussed matters of local interest.

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BELALIE NORTH (Average annual rainfall, 16in. to 17in.).

May 25th.—Present: six members.

THE CARE OF HARNESS ON THE FARM.—The meeting took the form of a discussion on this question. Mr. Warner opened the discussion, and said that on many farms the harness was very often neglected and left out in the weather. Collars were frequently left on the ground or hung on a small piece of iron, and thus soon put out of shape. They should be hung on a rail, where there would be no danger of their being knocked off on to the ground, and given a dressing of neatsfoot oil twice a year. Mr. O. Zelm said the farmer should devote half a day before harvesting and seeding to the cleaning of all harness on the farm. Mr. O'Leary also spoke, and supported the remarks of the previous speakers.

BLYTH (Average annual rainfall, 16.46in.).

May 25th.—Present: 13 members and one visitor.

QUESTION BOX.—The question of making provision for the dipping of sheep was initiated by Mr. A. L. McEwin. He stated that he had made inquiries into the cost of putting in a plant for the dipping of sheep and found that it would cost about £100. He did not think it would pay a farmer to erect a dip for private use unless he had about 2,000 sheep. He thought several farmers should co-operate and erect a dip, or, failing that, one farmer could construct a plant and receive a guarantee from his neighbors that they would use it. He estimated that sheep could be dipped at an approximate cost of 10s. per hundred. He did not consider it advisable to travel the sheep more than four miles after being dipped, on account of the dust, and for that reason it would be necessary to have several dips in that district. Mr. C. W. Zwerk suggested that the district council should be approached to see if they would undertake the erection of the dips. Mr. W. O. Eime spoke in favor of the dipping being done on a co-operative basis. Mr. J. S. McEwin said that if the dips were erected by the Government, it would be necessary to have a man in charge of the work, and that would make the dipping more expensive. He thought they could not do better than co-operate and erect a suitable dip.

BOOLEROO CENTRE (Average annual rainfall, 15.83in.).

May 4th.—Present: 13 members and two visitors.

WASTE MATERIAL ON THE FARM.—The Hon. Secretary (Mr. G. Ashby), in a paper on this subject, said one of the things that were noticed by any visitor to a farm was the implements that had been put aside to make room for new and more up-to-date machinery. Some of the machines were obsolete, and others worn out; but most of the parts of the old machines could be brought once more into service. Bolts were an every day requirement on the farm, and numbers of these could be gathered from old machines. If the farmer had a blacksmith shop on the farm, S-hooks, swings, and eyebolts could be made from the frames of the discarded implements. An old stripper could be made to serve quite a number of purposes. The drum could be used either for a trough or small chaff bin. The wheels and frame could, with very little trouble, be converted into a very serviceable cart for conveying seed, super., and fencing materials to all parts of the farm. The beaters could also be used as a platform for the slaughtering of the sheep, and if the sheep was placed on them the blood would flow more freely, and the skin and carcass would be kept clean. Old ploughs should be taken to pieces and the ironwork stored away for use on some future occasion.

BUNDALEER SPRINGS.

May 22nd.—Present: 12 members and three visitors.

BACON-CURING.—Mr. M. O'Dea, in a paper on this question, considered the selection of the pig one of the most important points in the making of good bacon. He preferred to use an animal weighing between 90lbs. and 130lbs., because a pig of that size could be raised in about six months, and was very much easier to handle than a larger beast. If the head was cut off close to the ears it could be used for bacon, and by so doing most of the blood would be drained from the body. When the flesh had set, it could be cut and boned, and the shoulder and middle left in one piece. It should then be sprinkled with salt and left for 12 hours to allow the blood to drain, because if the meat was put in the pickle without doing so the bacon would have a mouldy appearance. For a pig weighing 125lbs., the following ingredients for making the pickle would be required:—3lbs. of brown sugar, 9lbs. of salt, and 4ozs. of saltpetre. The sides of the pig should then be placed in the pickling trough with flesh side up, and the mixture spread over the meat. It should be left in the trough and turned every other day by putting the top side to the bottom and applying more of the mixture. If a spicy flavor was required, about ½oz. of spice should be placed in a small muslin bag and put in the brine. After 15 days the bacon could be taken out of the pickle and soaked in water for about 12 hours to facilitate rolling. By using four straps to draw the bacon into shape, the string could be more easily put on, and every round tied in the form of a half hitch. The bacon should then be put into the smoker and left until it showed light amber color. Care should be taken not to allow the bacon to become too hot, or the flavor would be spoilt. He favored the box smoker, with a pipe or small trench leading from the fire-box, which should be 12ft. from the smoke-house. When the bacon was taken out of the smoker it should be hung up in a dry place for three or four days, after which it would be ready for use. The quantity of bacon that a pig would make was about two-thirds of its dressed weight. In reply to a question, Mr. O'Dea stated that 25 per cent. of cold water should be mixed with the hot water for scalding purposes. Clean wheat was not to be recommended for young pigs, because if they were fed on it, 1s. per lb. would be required for the bacon, and there would be no margin of profit. To make good bacon there should be a fair proportion of lean with the fat. If the bacon was allowed to soak in its own brine it would not be necessary to rub in the salt, &c. Chips from the wood heap could be used for smoking bacon.

GLADSTONE (Average annual rainfall, 16in.).

May 25th.—Present: 15 members and one visitor.

PICKLING AND SOWING WHEAT.—Mr. J. H. Sargent, in a paper on this topic, said all wheat should be pickled before sowing. There were various methods that the farmer could adopt when pickling seed wheat, but he gave preference to that plan

of pickling the wheat on either a cement or board floor. If smut was visible in the seed, a half a pound of bluestone should be dissolved in about 6galls. of water. That quantity would pickle about four bags of wheat. Late wheats, such as Yandilla King and Marshall's, should be sown first. He considered Federation one of the best wheats for that district, but it should not be sown too thickly. Marshall's as a rule, did not germinate too well, and therefore the seed should be used at the rate of about 1½bush. to the acre. King's Early was a very good wheat to sow for hay, but it should not be sown until about the end of June. Gluyas was another early wheat, and one that gave good results, but it was inclined to go down if the weather was at all rough. Leather Head was a new variety in that district, and he had given it a trial for two years, but he could not recommend it, because the heads were inclined to break off at the first joint. Golden Drop was another good wheat, but, like Gluyas, it was inclined to go down rather easily. In regard to the depth of sowing, he thought that when the land was dry the seed should be sown as shallow as possible, but after rain had fallen the depth of sowing could be increased without any danger.—Messrs. Hollett and Lines tendered a report on the Conference held at Wirrabara.

LAURA.

April 26th.

BEAUTIFYING THE HOMESTEAD.—There were few farms in the district on which there were no suitable places for growing timber, said Mr. W. G. Cockshell in a paper dealing with beautifying the homestead. Corners of paddocks, which should always be fenced, could be planted, and also a strip about two chains wide on the approach to the homestead. On the north and west sides the house and buildings should be protected by a break of timber. The sugar gum was the most generally suitable, but on flat, swampy land red gums could be planted. The trouble of fencing the timber would be amply repaid. He then dealt with the advantages of trees on the farm, and suggested that on areas on which the gums would not grow pepper trees should be planted. An interesting discussion followed.

LAURA.

May 31st.—Present: 16 members and two visitors.

FARM BUILDINGS.—Mr. F. W. Shephard, in a paper on this question, said:—"In visiting various homesteads throughout the district one cannot help noticing the differences which exist in the construction of farm buildings. It is pleasing to observe that present-day farmers are erecting more up-to-date farmhouses and outbuildings than was the case formerly. It is quite a treat to visit some farms and see the modern buildings that have been erected, with every convenince, which goes to show that the farmer is keeping abreast of the times. As a rule, farmers do not give enough consideration to the selection of the site and the laying-out of the homestead. Where possible, an elevated position should be chosen, so that the homestead can be well drained, as this adds to the appearance. A factor that often determines the site of the homestead is the water supply, and a good site on more than one occasion has had to be abandoned because of the lack of a water supply in close proximity to the proposed site. In building the house, an effort should be made to provide as many conveniences as possible. Special attention should be devoted to the construction of the kitchen. In a district like Laura it is an easy matter to beautify the homestead. Fruit trees, vines, all kinds of vegetables, as well as flowers, do well, and are a valuable asset to the farm, and go a long way towards making the home attractive and beautiful. When erecting outbuildings or sheds, endeavor to keep them square with each other, as nothing looks more unsightly than buildings facing all angles. It is an easy matter to run them parallel with one another, and thus add to the appearance of the homestead. Good sheds and yards improve the look of a farm considerably. These should be some distance from the house, but not at an inconvenient distance. Where practicable, stables and outbuildings should be constructed of stone, and situated at the rear of the house." Although there was a danger of fire with a straw roof, he would prefer straw to iron roofing for stables. They would be cooler in the summer and warmer in the winter, and also much cheaper. The chaff shed should be built at one end of the stable, so that those attending to the horses could walk along a passage way to the manger

when feeding the horses. On some farms he had noticed the chaff shed was more than a chain away from the stables. That meant a lot of extra work and lost time. If possible, water should be laid on to the stable, and a trough provided, as, in his opinion, horses would do much better if they could get a drink when they needed it. Farm horses could not be looked after too well; they should be given good, clean, warm quarters, and every attention. Where possible, the stables should be erected facing the east or north. They should be built on three sides with stone walls where possible. On the majority of farms there was plenty of stone suitable for building, and sheds could often be built at a very small cost, where good soil was obtainable. Sheds could be built with it, but the outside of the walls should be left 12 months before being flushed up, so as to allow the pug to wash out. If this was done, the sheds will last a lifetime. A good barn with an implement shed attached, was a necessary building on a homestead—in fact, among the most important. Those, where possible, should be constructed of stone, with an iron roof. A gable roof would be the best for the barn. If, when building the barn, wing walls were carried out about 14ft. on each side, two good implement sheds, covered with a skillion roof, could be provided at a small cost. That would obviate the need of centre uprights, and enable machines that were only taken out once a year to be stacked closely together. The front of the implement shed should be wire-netted, so as to prevent stock and poultry from gaining access. The floor of the barn should be of wood, and raised about 3ft. from the ground, so as to be able to truck wheat from the wagon to the barn, thus obviating a lot of heavy lifting. A good plan was to cement the wall round the top of the floor to a height of about a foot, so as to keep it mouseproof. Sliding doors should be affixed to all buildings, as they were more convenient than doors swung on hinges. A separate building of stone should be erected for milking cows, and a nice, warm shed provided, as the cows would do better and prove more profitable. The pigsties should be built some distance from the house, and good clean quarters should be provided for pigs to sleep in. If convenient, give a yard to run in, as they would do better than if confined in a stye all the time. The poultry should be enclosed in a yard fenced in with 6ft. netting, and not allowed to roam all over the homestead. The fowlhouse should be constructed of iron, and only the most profitable kinds of poultry should be kept on the farm. Every well-appointed farm should have a blacksmith's shop. Much time and expense would be saved if there was a smithy on every farm, as in it many odd jobs could be done, and with care and practice horses could be shod. The house, sheds, and gates should be kept well painted. That not only improved the appearance of the homestead, but added considerably to the durability of the timber, and would be money well spent. All the buildings should have proper gutters to carry away the water, and one should not wait until they overflowed before cleaning them out. Farmers would make farm life more attractive if they devoted more attention to carrying out improvements, systematic working, obtaining good implements, and keeping tools in good order. "Always purchase good implements and tools, as a good implement more than makes up the difference in price, and does more satisfactory work. Have a place for everything, and when finished with an implement or a tool put it back in its place. Farming is one of the most healthy occupations, and those engaged in it should endeavor to make it as enjoyable as any other; and this may be accomplished by obtaining a thorough knowledge of the occupation and having a fair amount of recreation," he concluded. Mr. E. G. Blesing suggested the advisability of placing good stout posts at the corners of the stables. Mr. W. Stevens did not agree with the suggestion that a water trough should be in the stable yard. Mr. H. R. Lines suggested that all corner posts about the homestead should be painted white. He was opposed to watering horses in the stable. Mr. J. J. Aughey said horses would do better and work better by being watered at regular periods, and not allowed to drink when they felt inclined. Mr. F. T. Hughes said that the work necessary to keep straw roofs on stable year by year would make the roof more expensive than an iron roof in normal times. Mr. W. G. Pledge said an iron roof, properly constructed, provision being made for ventilation and draught, would be as cool as a straw roof, and in the long run prove the cheapest.

LEIGHTON (Average annual rainfall, 16in. to 17in.).

April 23rd.—Present: 11 members.

Co-operative Shearing.—Mr. T. J. Warner delivered an address dealing with this question, at the conclusion of which it was determined that a public meeting should be called to discuss the proposal.

PORT PIRIE (Average annual rainfall, 13.21in.).

March 23rd.—Present: nine members.

Mr. A. W. Noll addressed the meeting on matters dealing with seeding operations, and the Hon. Secretary (Mr. A. M. Lawrie) gave a report of the Mid-Northern Conference recently held at Wirrabara.

REDHILL (Average annual rainfall, 16.79in.).

April 23rd.—Present: six members.

Mr. W. L. Pengilly gave a report of the recent Conference held at Wirrabara. At a later meeting, held on May 24th, Mr. A. N. Harris, in a short paper on "Small Things that Count," said olive and almond trees should be planted around the homestead, because not only did they form a breakwind, but the fruit of both trees could be sold at good prices. The implements of the farm should not be left out in the weather, as was too often noticed on many farms, but kept under cover and given a coat of paint occasionally to preserve the woodwork and prevent the iron from rusting. The use of a rope-making machine was a point that should not be overlooked, because most of the hay bands could be converted into good serviceable ropes. All the harness connected with the work of the farm should be thoroughly oiled with neatsfoot oil, to prevent it from cracking. A stack of straw should be built as reserve fodder for the stock in times of drought. He strongly criticised the careless way in which old pieces of wire were left about the paddocks. Serious injury to horses and other stock could easily result from that practice, and if during haymaking the pieces of wire were picked up by the binder, a serious accident might occur.

WHYTE-YARCOWIE (Average annual rainfall, 13.91in.).

May 20th.—Present: seven members.

Points for Producers.—Mr. S. W. Robinson, in a paper on this subject, said fallowing should commence about the 1st of July. After ploughing, and when sufficient rain had fallen, the land should be harrowed, and then cross-cultivated during the spring. After harvesting operations were finished, the fallow should be cleared of any rubbish, such as bushes and stones, and seeding commenced about the beginning of May; but the time of starting seeding was a point on which the farmer should use his own judgment. 250 acres of crop put in thoroughly would in all probability yield just as much, if not more, than 300 acres drilled in carelessly, and the 50 acres could be used to advantage as grazing land for sheep. During the time between seeding and harvesting of the crops one should see that the machinery and implements necessary for those seasons were in good working order. There were many different opinions as to which was the correct stage at which to cut the crop for hay, but he preferred to cut it when the crop showed good color and a certain amount of grain. Stooking should be commenced the day after the crop was cut. That side of the sheaf that had rested on the ground should be placed on the outside of the stook. When carting hay, that part of the crops that had been cut first should be first taken to the stack, and the best of the sheaves kept for the roof.

WHYTE-YARCOWIE (Average annual rainfall, 13.91in.).

June 15th.—Present: 11 members.

Garden on the Farm.—Mr. F. H. Lock, in a short paper on this question, pointed out that practically all stone fruits and vegetables could be grown with success in that district. The scarcity of water was the only difficulty, but if the garden was so situated that it could be flooded twice a year, good results would be obtained. In the discussion that followed several experiences were related. One member stated that well water, when first applied to the garden, did not apparently affect the fruit, &c., but if constantly used, it would be noticed that it did not give such good results.

BELALIE NORTH, March 23rd.—Mr. Warner read an extract from the report of the Advisory Board dealing with the Fetilizers Act, and the meeting also discussed the question of diseases of the grape vine. At a further meeting, held on April 27th, the question of grape diseases was further discussed.

PORT BROUGHTON, May 3rd.—The meeting took the form of a review of the work of the local Branch of the Agricultural Bureau.

YACKA, June 19th.—The meeting discussed the question of "Weevil in Wheat," and a committee of seven members was appointed to make a weekly inspection of the local wheat stack.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

CLARE (Average annual rainfall, 24.30in.).

April 26th.—Present: 18 members and six visitors.

BEE-FARMING.—Mr. T. Bolton, a visitor from Victoria, and past president of the Apiarists' Association of that State, delivered an address on the question of "Bees and Bee-farming and their Relation to Trees and Land." In the Pacific fruit settlements of America, he said, bees were welcomed, it being recognised that their absence in the spring resulted in defective and uncertain setting of the fruit. Bees would help largely in the settlement of poor land, of which they had so much in Australia. His remarks particularly applied to what they called in Victoria third and fourth class land, that would only carry one sheep on four to eight acres. This was originally granted to settlers in cultivation blocks of 1,000 acres. These men did some clearing and tried to grow wheat and wool; but they were up against an impossible proposition; the land was totally unsuitable, and eventually most of the unfortunate settlers were frozen out, the land reverting into large blocks in the hands of the few stronger men who survived. Trees were absolutely necessary for equalisation of rainfall and water conservation in the soil. But were all land first-class and arable such a condition would inevitably follow, for the forest would gradually give way to the plough, so that low class scrub country played a great part in maintaining the harmonious balance of nature. Whoever cut down timber on land unfit for other purposes committed a crime against humanity. But even the poorest scrub land, unless some better use could be found for it, would eventually be swept of its timber to make way for a few sheep. That was where bee culture filled the bill. He described the work of the Victorian pioneers in the industry, and the special legislation for its promotion. A bee farmer could take up a bee site of one to six acres for 2s. 6d., and rent the treetops of a 1,000 acre block for a ½d. per acre, the land being probably rented by a sheep farmer, who had no rights over the timber. A total of three such blocks might be held by the one bee farmer, but no more, and no one bee block must be held within less than two miles from the next, thus safeguarding food for the colonies. Some advantages peculiar to the industry were referred to. If through absence of freight for instance, they could not sell the honey it could be stored indefinitely with safety, even improving with age. Then there was the cost of transport of a ton of honey worth, say, £40, with that of a ton of hay or wheat. Not enough attention was paid in Clare to bees. He had been judging at Melbourne shows for years, and had never seen better honey than an exhibit from Stanley Flat. But to prevent overstocking there must be regulation. In Stanley Flat, for instance, 50 families might keep 10 hives each, and if some, or all of them could not spare the necessary time and attention they might arrange with one man, preferably a returned soldier, to undertake the work on the share system, thus ensuring him a pleasant and not arduous living, and adding to their own wealth. Other phases of the industry were then briefly glanced at, including smoking and the best apparatus for the purpose. Australia had no native bees. The original Italian bees in Victoria were obtained from Kangaroo Island, which had been specially reserved for them by the South Australian Government, which had first imported that breed to Australia. They were far superior to

the black bees, being more vigorous and better workers. From one Italian hive he had taken six kerosine tins of honey, and had known an increase of 12lbs. of honey to take place in 1¼ hours. The life history of the bee and its habits were next referred to. Everything depended on the queen. Some bees died after six weeks' work, whilst others lived twice as long, working all the time, thus adding enormously to the store of the hive. Queens should be reared only from the best and strongest hives, and thus continual selection would lead to continually better results. It took 16 days for a queen to hatch from the egg, but five days longer for the worker, by reason of the different food. About a week after hatching the queen bee took her flight from the hive into the world for mating purposes. It was generally thought she flew far and high so as to meet with a drone from a strange hive, thus preventing inbreeding. The aerial union effected, with the resultant death of the male, the queen returned to the hive and started laying within four days, continuing to do so for possibly two years or even longer, the one fertilisation being lifelong. After the season for rearing queens was over, all drones were expelled, not killed, from the hives, and should they return their sisters repeated the process until they finally accepted their lot, desisted from the attempt, and died. Bees when sick would also leave the hive and die. The hive and method of extraction were described. By returning the empty comb to the hive a great saving of time was effected, leading to a greater storage of honey. Foul brood was explained, and how it was spread through robber bees attacking an affected and weakened hive; hence the necessity for the bees to be strong and healthy. Loss of hives in swarming could be stopped by cutting the wings of the queen, who fell to the ground, and the swarm would return. Where one could not be on watch, as in the case of colonies miles distant, the same effect could be attained by attending every 10 days and destroying the eggs laid to produce queens, as in no case would the queen leave the hive with a swarm unless a successor be left behind. The proportion of beeswax to honey was about 1 to 70. Bees would travel far, and an instance was known where they crossed 10 miles of water from an island to the mainland for honey. Pollen mixed with honey formed bee-bread for the young. Some years pollen was scarce, with resultant bad effects for the hives. No satisfactory substitute had yet been found. In reply to questions Mr. Bolton said there was no method to prevent honey from candying, but it could always be re-melted. He did not believe there was such a thing as eucalyptus flavor in honey. Italian bees were less subject to foul brood than the black.

LONE PINE.

May 21st.—Present: 16 members and seven visitors.

PLANTING TREES.—In a short paper dealing with this subject Mr. H. E. Schwartz said trees should be planted on every farm to provide shelter for the stock. The trees should be planted 18ft. apart in holes about 2ft. square and 2ft. deep. If a small elevation was made in the middle of the hole it would give the roots a tendency to immediately strike downwards. The earth around the young trees should be packed in fairly firmly, and stakes driven into the ground, to which the tree should be tied to prevent it swaying about in the wind. It was very important to erect a substantial fence around the young tree in order that the stock would not damage them.

LYNDOCH (Average annual rainfall, 23.01in.).

May 23rd.—Present: 13 members.

QUESTION BOX.—The meeting was devoted to the discussion of various items of interest. Several members maintained that between the ages of two and three weeks was the best time at which to tail lambs, and they favored the use of the knife as the cleanest, safest, and best method. The cause of the recent mortality among sheep was also discussed at length, and as a preventive measure members suggested frequent change of pasture, and feeding on chaffed hay.

LYNDOCH (Average annual rainfall, 23.01in.).

June 20th.—Present: 18 members.

ANNUAL MEETING.—The Hon. Secretary (Mr. J. S. Hammatt) presented the annual report, and the election of officers for the ensuing 12 months took place.

NANTAWARRA (Average annual rainfall, 15.90in.).
May 23rd.—Present: eight members and six visitors.

ERECTION OF SHEEP DIP.—In opening a discussion on this question, Mr. S. Sleep said that as sheep dipping was to be made compulsory he thought that some preparation should be made for the farmers of that district. Mr. Uppill said the nearest dip meant two days' work. He favored the erection of a private dip, because one would know the strength of the dip, and it would be better managed. Messrs. Herbert and Sutton also expressed the same opinions as the second speaker. Mr. Young said the main point was to see that the dip was effective. He understood the swimming of the sheep through the dip to be most essential, because that caused the wool to open, and allow the dip to thoroughly penetrate the fleece. He did not favor the practice of simply immersing the sheep in a hole filled with the liquid. Mr. J. Nicholls thought the time inopportune for the erection of a dip, because of the high price of materials and the shortage of labor.

NANTAWARRA (Average annual rainfall, 15.90in.).
June 30th.—Present: eight members.

MANAGEMENT OF FARM HORSES.—Every farmer who kept 16 or more draught horses, said Mr. P. Nottle, in a paper on "The Management of Farm Horses," should keep a stallion on the farm. As an illustration, he would take a farmer with 20 horses; at least 12 of them should be mares, and if they were mated to the stallion one could reasonably expect 75 per cent. of them to get in foal. The mares could be worked during seeding, and nearly all through fallowing time, because some of them would not foal until late in the season. With that system the farmer would have the younger horses coming on, and if he was short of horses, they could be broken in when they became three years of age. He was of the opinion that when the fallow was being worked back was the best time at which to break in the young horses. He did not think it advisable to sell the foals when they had been weaned, for if they were kept until about three years old they would not eat a very large quantity of feed, and they would bring a good price in the sale yards; and even then he would not dispose of the fillies unless they proved themselves to be unreliable workers. He preferred selling the older horses when they became about 9 or 10 years old, when they would still command a fair price, and though that plan might make the team a little more difficult to handle, it would overcome considerable loss through the team eventually becoming too old for work, and practically valueless as far as selling purposes were concerned. In selecting the stallion, one need not choose an animal for show ring purposes; but careful judgment should be exercised to see that the horse was sound and of such a build as would be likely to leave good serviceable farm horses. He should, if possible, be purchased when young, and made to take his share in the work of the farm, excepting during the months of season. By so doing he would be kept in good, hard condition. The speaker expressed the opinion that if that plan were carried out, the stallion would earn the reputation of being a good horse. Members discussed the paper at length, and agreed with the writer on most points. Most of the members, however, thought the young horses should be broken in when two years of age.

RIVERTON (LADIES) (Average annual rainfall, 20.48in.).
May 28th.—Present: nine members.

VEGETABLE GARDEN ON THE FARM.—Mrs. F. G. Hannaford, in a paper on this subject, said in laying out a vegetable garden one should first select a suitable piece of land and prepare a good seed bed. Early varieties of cabbages and cauliflowers should first be sown, and when the plants were above the ground they should be thinned out to about 3in. apart. When the seedlings were ready for transplanting they should be planted in rows 18in. apart. It was important to see that the soil around the plants was kept fine and loose. Turnips should be sown in good, rich soil, and thinned out to about 9in. apart. May and June were the correct months in which to sow peas and broad beans, and if they were inclined to grow too rank, the tops should be pinched off. Peas should be sown in three rows 3in. apart, and then a space of about 18in. left, and then another lot sown in the same manner, because that helped the plants to keep upright, and it would also

make the picking much easier. It was a good plan to sow carrots at the same time, as they would be ready to pick when the winter vegetables were finished and before the summer ones were ready for use. Tomatoes should be planted out in September in good rich soil, with each plant about 3ft. apart. If one wished for good early tomatoes it was necessary to prune them about the first week in January. French beans were a very profitable vegetable to grow, but they should be planted in a shady part of the garden and be protected from the hot north winds. The writer favored the dwarf variety, because they shaded the ground, and were not so likely to be damaged by the wind. In order that a supply of the beans should be maintained, it was a good plan to plant a fresh quantity of seed every three weeks from September to the end of November. Lettuces should be planted in very rich soil, and if one wished to obtain the best results the plants should be ready for use about six weeks after planting out.

RIVERTON (Average annual rainfall, 20.48in.).

June 1st.—Present: 14 members.

ENSILAGE.—A paper on this question was contributed by Mr. Hugh Davis, in which he dealt with the history of ensilage, the method of manufacture, and the advantages that were derived from having a silo on the farm.

ROSEDALE.

May 23rd.—Present: 24 members and two visitors.

FALLOWING.—Mr. H. F. Mugge, in a short paper on this question, said land in that district was very difficult to deal with, on account of the varying nature of the soil. The black soils could be worked with more advantage by early ploughing and plenty of cultivation. He did not favor consistent deep ploughing, because fallowing to a depth of 3in. or 4in. gave just as good results as land worked 6in. or 7in. deep. One could certainly plough slightly deeper than the first-mentioned figures if the conditions were favorable, and as most of the farms in that locality consisted of hillsides or red soil that was inclined to set down hard, he did not advocate working the soil down to a fine tilth. The hillsides, if left rough ploughed, would hold the moisture better, and prevent the water from washing deep ruts in the land. Should harrowing be necessary after seeding, it was a good plan to harrow in the same direction as the water had run, and thus cause only a small stream of water to flow down the harrow marks; if the land were harrowed in the other direction, the water would follow the marks of the harrows for a certain distance and then break through in one large volume that would make a deep rut in the land.

SADDLEWORTH (Average annual rainfall, 19.69in.).

March 23rd.—Present: eight members.

THE OBJECTS OF THE AGRICULTURAL BUREAU.—Mr. B. C. Klau, in a paper dealing with this question, said one of the main reasons why the Bureau meetings were held was to find out, by means of discussion and interchange of opinions, the best methods of working their farms. The speaker further pointed out that it was the duty of the members of the Bureau to thrash out those problems with which they were faced for the benefit of the coming generations.

At a later meeting, held on April 20th, a paper under the title of "Stocking the Farm" was contributed by Mr. A. Jamieson. The statistics that appeared from time to time in the daily press, he said, pointed out to the producer that the livestock of the world was gradually being depleted. The pastoralist only carried that amount of stock that he was able to feed from the growth of natural grass on his holdings. In that point the farmer had an advantage, as he was able to cut and store fodder for the stock. In his opinion farmers carted too much of their harvest off the farm in the wagon instead of turning it into beef, mutton, and pork. They were certainly faced with the question of the shortage of labor, but in cases where there were families at home much could be done to increase stock-raising. He was glad to know that at last many farmers were making steps in that direction. There was practically an unlimited field ahead of the farmer for the raising of sheep, but there

were obstacles with which they were faced. The power of the mail on the land came from the sale of his wheat, and the profits from that product just now were comparatively small. At this time of the year the farmer who had a number of ewes often wondered how he was going to find sufficient feed for his sheep. By hand feeding the sheep that difficulty could be overcome. One pound of chaff and a small quantity of bran fed to each ewe daily would keep them in good condition. Last year he had hand fed 100 ewes during lambing, and considered that he had saved 10 per cent. more lambs than if they had been running in the paddocks. A simple feeder could be made by sinking two posts, about 9in. in diameter, a chain apart. A wire should then be placed around one post and bags slipped on. The wire should be strained so that the ends of the bags were about 1ft. off the ground, and the ends of the bags sown together, and a few short stakes should also be driven into the ground. The sheep would not be able to get into that description of feeder and spoil the feed. The hand feeding should be adopted gradually, and if one placed a small quantity of bran on the ground near the feeder the sheep would very soon take to using the feeder. He believed more cattle could be carried on the farms by a system of hand feeding. They were too anxious to sell the calves when they were marketable. If cows that were not suitable for dairying purposes were allowed to suckle their calves longer, the calf would bring a good price when about 12 months old. The speaker also dealt with the profits that could be obtained from the judicious feeding of pigs and poultry. The question of "Farm Accounts and Bookkeeping" was dealt with by Mr. F. Snell. In opening his remarks the writer of the paper said he had two objects in view when commencing bookkeeping on the farm. One was to know whether certain work on the farm was paying, and to find out which part of the farm operations was paying best; secondly, to keep the accounts in such a way that one could easily make up the income tax returns. He referred members to an article on bookkeeping on page 431 of the December, 1917, *Journal*, written by Mr. D. Aikins, of McNamara Bore. The paper contained a number of illustrations as to the method of procedure for keeping books of farm accounts.

SADDLEWORTH (Average annual rainfall, 19.69in.).

May 25th.—Present: nine members and two visitors.

DAIRY-FARMING.—Mr. W. Scales, in a paper on the question of "Successful Dairy-farming," said one of the most important points in the foundation of a dairy herd was the selection of the cattle. Good cows could be found amongst almost any breed of cattle, but for butter production alone he favored the Jersey cow. If a large milk supply was the object the Jersey could be crossed with a Holstein or some other large-framed type of cow. One of the drawbacks of the Jersey cow was that when her milking days were over, she would not bring a good price from the butcher. In judging a good cow the following points should be observed:—Full eyes, narrow neck, good width across the hips, udder well forward with good teats, large milk veins, and a good escutcheon. The cow's age could be determined by the appearance of the horn. Two years should be allowed for the tip, and one year added for every ring on the horn that could be noticed. A more definite method was by the appearance of the teeth. The calf's teeth were narrow and white, and when two years of age the first two broad permanent teeth were visible. Two more teeth came through every following nine months until about the eighth year. After that the age was determined by the wearing of the teeth. One should endeavor to select the best animals, because a good cow would cost no more to keep than a bad one. The services of a thoroughly reliable bull should be secured and mated with the best cows in the herd. The heifer should not calve until about 2½ years of age. The calf should be taken from its mother at once, but if the cow's udder was congested it was advisable to allow the calf to run with the mother for a few days, as that would help to relieve the swelling. If the udder was washed with warm water and soap and then rubbed with camphorated oil, much relief would be afforded. The calf should be induced to drink by putting the finger between its lips and pushing the head down into the bucket containing the first milkings of the cow. After the first week it could be weaned off by giving separator milk, to which a little boiled linseed oil had been added. The food should always be luke-warm and all the buckets kept clean, otherwise the calves would be troubled with white-scour.

If that should happen a few doses of castor oil, and later on a small quantity of limewater mixed with the food, would in all probability cure them. Each cow should be allotted a stall, and not fed until milking operations were finished. When feeding with chaff he preferred using nose-bags, because the animals did not waste so much food. In the absence of natural green feed sound chaffed hay and crushed oats or bran would make an excellent feed. Every cow should be treated as a milk-making machine, and be kept working at her fullest capacity by judicious feeding and frequent change of pasture. A salt lick should also be provided. If the cow was worried or excited before milking, trouble would be experienced in getting the milk from her. If possible the cows should be milked at regular hours. Cleanliness was one of the most important points in the successful production of dairy produce, and before milking the hands should be quite clean, and each cow's udder wiped with a damp cloth. Milking should be done quickly by using the whole hand, and treating the two foremost teats first. Great care should be exercised when stripping to see that each cow was thoroughly finished, otherwise she would soon give less milk, and probably dry off altogether. One should endeavor to make the cows come in about April. Prices for produce at that time of the year were usually very good, and the calves when weaned would have the benefit of good green feed. Where a large number of cows were kept the milk should be treated twice daily, but on the majority of farms where only three or four animals were in milk, time could be saved by straining the evening's milk into other vessels, and in the morning any cream that had risen should be skimmed off and the milk warmed up before mixing with the morning's milk. The cream should be stirred up twice each day in order that it would ripen evenly. During the warm weather a little salt would help to preserve the cream and prevent it from ripening too quickly. During the winter months the temperature of the dairy should not be allowed to get too low or bitter cream would be the result. If that should occur every article should be removed from the dairy and the building coated with white-wash. All dairy utensils should be scalded with hot lime and water and exposed to the sunlight for three or four days. During summer too high a temperature would have a very bad effect on the cream. Where an up-to-date dairy was not available, the cream cans should be covered with perforated zinc, and after sun-set placed outside on a table in the fresh air and taken into the dairy again in the morning. Four of the chief points to be kept in mind in order to obtain first quality butter were color, flavor, texture, and salting. The first was generally determined by the breed of cow and the class of feed she was receiving. The flavor of the butter depended entirely on the cleanliness of the person handling the cream and the surroundings of the dairy. The correct texture of the butter would only be acquired after one had had considerable experience in making the finished article. Only the finest quality of salt should be used, allowing about ½oz. to every pound of butter. He did not think there was so much bad butter produced through a want of knowledge as through a mistaken idea that it did not pay to go to the trouble of producing butter of a first-class quality. The action of many store-keepers had a tendency to encourage the latter class of producers by pooling the customers' butter and treating the one who made a first quality sample on the same basis as those who were not so careful. He realised that dairying was to a large extent an industry devoted to those districts where there was an abundance of green feed, but even in that district he considered it one of the best paying sidelines to have on the farm.

DAIRYING AND ENSILAGE.—The Hon. Secretary (Mr. F. Coleman), who contributed a paper on this subject, said the outlook of the dairying industry in that district was very promising. It was the intention of a company to start a butter factory in Saddleworth, and that should encourage farmers to keep good dairy cows. It was generally recognised that while the horses of the farm were provided with good fodder the cows were left to pick up their feed in the stubble paddocks, with the result that they very soon dried off. The conservation of fodder in the form of ensilage provided a means of feeding the cattle with good succulent food during those seasons of the year when the natural herbage was scarce. Ensilage was made from practically any green fodder, and was preserved in bulk by controlling fermentation. As the fodder was packed into the silo or pit the air would be excluded, and the temperature controlled. When filled, the mass should be covered with chaffed straw, and a suitable heavy weight placed on the top to keep the air

out. Ensilage well made and preserved would keep for an indefinite period, and could be used for feed whenever desired. Almost any crop good for feeding off in its natural green state would make good silage. Crops of a very juicy nature, such as mustard, pease, &c., should be mixed with cereal crops of a firmer nature like barley, rye, and early wheat. He had had considerable experience in making silage, and the 25ft. tub silo at present on his farm was constructed of jarrah studs and lined with plain galvanized iron. Openings made on the side of the structure allowed the silage to be taken out with very little difficulty. In such a silo the even spreading of the fodder was very important, or the air would get in and spoil some of the contents. The Director of Agriculture had suggested that the silo should be built smaller at the bottom on the inside so that as the green fodder settled it would tend to keep still closer to the sides. Crops suitable for silage could be grown and handled before haymaking commenced in September or October, or if maize or sorghum were grown it could be attended to after harvesting was completed. The advantages of ensilage could be briefly outlined as follows:—A crop that would dry to one ton of hay would make five tons to six tons of ensilage. The cost would not exceed 10s. per ton. It could be kept for an indefinite period, and there was no danger of loss through fire. The stock would keep in much better health and condition, and an increase would be obtained in the milk and butter returns. It was also a most effective method of storing fodder for seasons of scarcity. Fed almost exclusively, 45lbs. per day would be a fair ration for a cow.

SADDLEWORTH (Average annual rainfall, 19.69in.).

June 22nd.—Present: seven members and one visitor.

THE BLACKSMITH SHOP ON THE FARM.—Mr. R. Hannaford, in a paper on this question, said a suitable site should first of all be chosen for the erection of the smithy. It should not be built too close to any haystack or buildings roofed with straw. The shop could be about 15ft. x 10ft. and 9ft. high. A building of those dimensions would meet all the requirements of the average farmer. As galvanized iron was very expensive, he thought the shop could be built of karri palings, which could be purchased for 30s. per hundred, and iron used only for the roof. Such a building should not cost more than £10. A still further saving could be effected by erecting the shop against another building. The following tools would be necessary for the equipment of the shop:—A portable forge, with a geared hand blower, and a stone-built hearth, with an anvil, weighing not less than 1¼cwt.; also a set of ½in. swages for same (for making harrow tines, &c.); about 6 pairs of tongs, to handle ¼in. to ½in. iron; drilling machine, large enough to take ½in. round shank drills, and about half a dozen drills of various sizes; a 4in. vice; engineer's hammer, about 1½lbs., also a sledge hammer, about 8lbs. or 10lbs.; stock and dies, to cut ¼in., ⅜in., ½in., ⅝in., and ¾in.; a set of shoeing tools, and a hack saw. All that would be needed to start would be a few pounds of ready tapped nuts, mostly ½in., ⅝in., ¾in., and ⅝in., a couple of bags of coal, and a few bars of iron of different sizes. The best iron and coal would be found to give the best results. When buying stocks and dies, one should secure a well-known make, in order that new dies could be purchased in case any one of the dies was broken. A plant such as described above would probably cost about £40 at the present time, although any farmer with a fair-sized farm would soon save the amount spent in tools, &c. Some farmers paid as much as £30 to £40 a year in blacksmiths' accounts, and he pointed out that if they had a plant, and saved one-quarter of that by working on wet days, it would pay very well. It was not only the work done that should be considered, but also the time one saved, especially if four or five miles from the blacksmith. Another advantage in having a shop was that repairs were done properly, and not patched up with wire, &c. Once a repair was made with wire, it was usually left until it broke again, and that generally happened when one was very busy. Another advantage was that one could use up many scrap pieces of iron and steel that otherwise would lay around the place for years. There were many simple things that almost any farmer could do if he had a forge, such as making S hooks, eyebolts, various other bolts, harrow tines, links, split links, spikes, &c.; sharpen chisels, picks, bars, also plough and cultivator shares, and reverse cultivator shares; mend many kinds of breakages, and, with a little practice and care, he would be able to shoe his own horses. Those things could be done on wet days, when it was too

wet to do anything else, so that the farmer would not be neglecting the other work of the farm to do the blacksmithing.—Mr. A. Fraser read a paper on "Early Green Crops," and Mr. H. G. Kingston also contributed a paper on the question of "Ploughing."

SALISBURY (Average anual rainfall, 18.57in.).

May 7th.—Present: 16 members and three visitors.

QUESTION BOX.—The meeting took the form of a question evening. The question as to whether the sowing of stubble land with a catch crop of oats or barley for feeding off early in the season, then stripped, would be profitable, was discussed. Some members were of the opinion that it would not be profitable, others thought if the land was only cropped once in three years it could be done successfully. The time of sowing lucerne and the quantity to be used, also the cheapest method of watering were discussed. Members agreed that the seed should be sown during September or October, and that 7lbs. of seed should be used, but for grazing purposes 10lbs. was considered better. For irrigation members thought that where the farmer had an engine that could be used for pumping purposes that plan would be cheaper, but where no engine was available Barossa water could be used. Other items of local interest were discussed.

TWO WELLS (Average annual rainfall, 16.36in.).

March 25th.—Present: 10 members and 16 visitors.

HARVEST REPORTS.—Mr. A. Pratt, who had conducted tests with the idea of ascertaining the most suitable varieties of wheat for the district, reported on the results secured. Eleven plots, varying in size from 1½ acres to 10 acres, were sown with 90lbs. of seed, and 1cwt. of super. per acre, between June 2nd and June 8th. The varieties sown, yields per acre, and bushel weight were as follows:—Old Federation, 16bush. (64lbs.); Baroota, 15½bush. (67lbs.); College Comeback, 12bush. (64½lbs.); Pratt's Comeback, 13bush. (68lbs.); Walker's Wonder, 11bush. (64lbs.); Queen Fan, 12bush. (65lbs.); Leak's Rustproof, 10bush. (65lbs.); Dart's Improved, 12bush. (65lbs.); Federation (Selection 1), 12bush. (65lbs.); Federation (Selection 2), 12bush. (65lbs.); Early Federation, 13bush. (65lbs.). Mr. Pratt stated that all the plots had suffered to some extent from the ravages of mice. A plot of malting barley was also tried, and yielded 20bush. per acre.

At a meeting held on April 29th Mr. J. R. Lawrie contributed a paper on "Dairying." He considered that one of the main reasons why farmers as a rule did not pay very much attention to cows was because they did not make any provision for housing the cattle during milking hours. In many cases the cows were milked just wherever they would stand. No sheds were provided, and in winter the ground soon became nothing less than a quagmire if no pavement were laid down. A shed to provide accommodation for at least six cows should be erected with a manger in front for feeding, and with a brick-paved floor. He thought the cows should be fed when being milked. Not only did they give their milk down more freely, but if they were fed at regular hours the cattle would soon get in the habit of coming home at those hours. A great deal of labor would be saved if the separator was kept in a room close to the milking shed. He considered it a matter of great regret that South Australia did not at the present time manufacture enough butter for her own consumption. A fair cow should return at least £15 per annum. Besides that there were the calves and pigs that could be kept on the by-products of the cow, which made it a profitable investment. In speaking of the milk business, he thought that the cost of transit from that district could be considerably reduced if a suitable train service was scheduled. At present there was a shortage of milk in the city, and if farmers were to keep the hay not required for the actual feeding of the stock, instead of selling it, and keep more cows, the animals would return better profits than the sale of the hay. If sufficient labor was not available for the hand milking of the cows he thought machines should be installed. He thought the time not far distant when most of the milking would be done by the machines. The high price ruling for good dairy cows made it a very expensive item to purchase first-class animals, but they should procure the services of a good bull, and endeavor to make the herd of a high standard. For milk-producing cows

he favored the Holstein and the Ayrshire. The pure-bred Jersey cow was too delicate for that district, but by crossing with a Shorthorn bull a good serviceable cow would be obtained. After touching on the subject of co-operation he then explained the various points of the different breeds of cattle.

WATERVALE (Average annual rainfall, 27.17in.).

June 17th.—Present: 11 members.

BLACK SPOT ON VINES.—Mr. A. S. Burgess, in reply to a question on this topic, said he had sprayed his currant vines with a 1 per cent. solution of bluestone, and the vines had been quite clean; other varieties that had not been treated were a complete failure. The question of oidium was also discussed, and members agreed that it was necessary to sulphur the vines when they had burst, and, secondly, when the shoots were 7in. or 8in. long. Weevil in wheat also was discussed, and members were of the opinion that the weevils were carried from one place to another in the railway trucks.

GAWLER RIVER, May 20th.—The Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch, B.Sc., M.R.C.V.S.) delivered an address on "The Diseases of Wheat."

GAWLER RIVER, June 24th.—The meeting discussed the question of "Weevil in Wheat."

SALISBURY, June 4th.—The Government Dairy Expert (Mr. P. H. Suter) attended the meeting and gave an illustrated lecture on the question of "The Feeding of Dairy Cows and Butter-making."

YORKE PENINSULA DISTRICT.

(TO BUTE.)

ARTHURTON (Average annual rainfall, 16in. to 17in.).

June 21st.—Present: six members.

ANNUAL MEETING.—The annual meeting of the Branch was held at the residence of Mr. John Welch, when the Hon. Secretary (Mr. W. L. Stephenson) presented the annual report, and the election of officers took place. The questions of "Weevil in Wheat" and "Dairy Cattle" were also discussed.

BRENTWOOD.

May 23rd.—Present: 13 members and six visitors.

TYPE OF HORSE BEST SUITED FOR FARM WORK.—Mr. F. L. Carmichael, in a short paper under this heading, considered the pure-bred Clydesdale to be the best type of horse for farm work. If farmers were to procure the services of a thoroughly reliable stallion, and mate him with the best mares, he felt sure the breeding of the farm horse would be raised to a very high standard. He considered it a mistake to mate Clydesdale mares with a Shire stallion. The Shire horse was far too heavy and clumsy for the work of the farm. Mr. Honner, in opening the discussion on the paper, did not consider it advantageous to work large and heavy horses in that district. He favored the medium draught, because they were more active. Mr. Nation spoke in favor of the heavy draught horse, but he pointed out that when breeding it was imperative to see that both the sire and mare were active animals. Messrs. Boundy and Newbold also discussed the paper, and both gentlemen favored the Clydesdale horse.

BUTE (Average annual rainfall, 15.42in.).

May 21st.

THE AGRICULTURAL BUREAU.—Mr. A. E. Bryant, in a paper under this title, said the benefits to be derived from the Agricultural Bureau were many and varied. It was very often noticeable that certain farmers made a specialty of one particular phase of farming, such as sheep, horses, cows, or poultry, &c. In the event of a discussion arising on any of those particular side lines the members were able to obtain first-hand knowledge from practical men. He thought the interest in the Bureau in that district would be stimulated if they occasionally held a homestead meeting, and inaugurated a "farmers' drive" of the district. The information that was obtainable through the medium of the *Agricultural Journal* was also of a valuable and educational character to the man on the land. The Secretary should be an energetic and active member, but he pointed out to the other members of the Bureau that without their assistance and co-operation on all matters the Branch would not be a success. Every member should endeavor to attend all meetings regularly and punctually, and contribute a paper or take part in the discussion of the subject before the meeting.

MAITLAND (Average anual rainfall, 20.08in.).

May 4th.—Present: seven members.

BEST METHOD OF DEALING WITH SMALL MALLEE SCRUB.—Mr. H. Bawden contributed a paper on this question. To obtain the best results from the mallee scrub land, he said, the scrub should be rolled down in August and burnt during February or March of the following year. The land should be lightly ploughed, say, to a depth of 2½in., and then sown with 80lbs. of super. He laid particular emphasis on the need for securing a good fire to pass over the mallee shoots. In the discussion that followed members expressed themselves as being in accord with the views of the writer.

MAITLAND (Average annual rainfall, 20.08in.).

June 1st.—Present: 10 members.

WHEAT-GROWING VERSUS STOCK-RAISING UNDER PRESENT CONDITIONS.—Under this title a paper was contributed by Mr. S. G. Smith. He was of the opinion that if wheat-growing was discontinued for any length of time the land would deteriorate to such an extent through lack of cultivation that it would not grow sufficient feed to carry the stock necessary to make the business of stock-raising a success. Even supposing conditions in that direction were favorable, there would still be the problem of shipping the produce away to the markets of the world. On the other hand, the farmer often thought that the obstacles in the path of the wheat-grower, such as the scarcity of freight, the enormous losses through mice, weevil, rain, and the difficulty of securing the required amount of labor, did not warrant the continuance of the production of wheat; but he pointed out that such difficulties should not deter the farmer from producing from the land livestock and grain in the largest possible quantities. The scheme for the disposal of wheat was often criticised, but he ventured to say that without such a scheme the farmers would not be so well off as they were at the present time. He considered that both of the products, grain and stock, were badly needed by the mother country, and it was their duty to make their land produce to its utmost capacity those articles, and leave the shipping of them in other hands. The paper was fully discussed, and all members agreed that while it was not possible nor advisable to give up wheat-growing, the farm should carry as much stock as possible.

MOONTA (Average annual rainfall, 15.22in.).

April 27th.—Present: 10 members and one visitor.

Mr. W. B. Stacey initiated a discussion on the subject of "The Fruit and Vegetable Garden on the Farm," and tabled some very fine quinces. At a further meeting, held on May 25th, Mr. H. J. Cadd, in the course of a paper on the subject of "How to Make Farm Life Attractive," said if farmers were to improve some of the

conditions at present existing on their farms, they would be able to dissuade many of the young men of the country from leaving the district and going to the city to earn their livelihood. Ample accommodation should be made for all members of the family, with a room for the use of visitors, and the appointments in and about the homestead made conducive to labor saving and comfort. Where water was available, a small garden should be laid out adjoining the home. Not only would that give the homestead a better appearance, but one would always be able to obtain a fresh supply of fruit and vegetables. Books should be provided for the young people, and the pursuit of clean, healthy games encouraged. An occasional social evening held in the homestead would help to break the monotony of many dull evenings. He strongly urged that a definite system of remuneration should be given to the young man on the farm. If a certain area of the crop were set aside for him, his interest in the working of the farm would be stimulated, and he would soon realize the value of money. As his credit in the bank increased, he should be induced to invest his savings in some good security. The young man should be encouraged to assist in the managing of the farm, and be made to feel that he was partly responsible for the successful working of the holding.

WESTERN DISTRICT.

BUTLER (Average annual rainfall, 16.61in.).

April 29th.—Present: 17 members and five visitors.

DOES WHEAT-FARMING PAY?—Mr. C. F. Jericho, in a short paper on this subject, said that the working of the land for the production of wheat only, in the mallee lands of that district, was not a payable proposition. If they wished to succeed, it was necessary to combine the raising of stock with wheat-growing. The keeping of sheep should be undertaken wherever it was possible, for besides keeping the land clean, the manure of the sheep was a valuable addition to the soil. Mr. A. H. Pfitzner also contributed a paper on the subject of "Does Wheat-growing Pay Under a 12bush. Average Without the Aid of Mixed Farming?" The speaker, after outlining the position, came to the decision that wheat-growing alone in that district was not a profitable undertaking.

EDILLILIE.

April 27th.—Present: seven members.

FARMING ON LOWER EYRE'S PENINSULA.—Mr. A. Palm read a paper on "Possibilities of Production from the Land in Lower Eyre's Peninsula," in which he maintained that an all-round policy of mixed farming, carefully carried out, would prove profitable, and that wheat-growing alone could not succeed. In the discussion which followed not one member disagreed with the writer's contentions, the experience of all being that, without such a method, farming in that district could not succeed, but that by carrying out the course indicated in the paper, a profitable living was assured. Mr. T. B. Turner considered the reason that farming in that locality had not paid was because the land had been occupied by a class of settler that had been used to wheat-growing only. All present emphasized the statement that the growing of oats, mainly for feeding to all farm animals, was the foundation of a profitable occupation.

KOONIBBA.

May 23rd.—Present: nine members and two visitors.

KEEPING FARM ACCOUNTS.—Mr. W. Post, in a paper under this heading, said two books were required for book-keeping on the farm, *i.e.*, a day-book and a ledger. The day-book should contain a record of all moneys spent and received.

It should also indicate to which accounts such entries should be entered in the ledger. It was important that the day-book should be kept up to date, otherwise entries would be overlooked and the work rendered useless. The ledger should contain a record of the farmer's private accounts and also a separate entry for each of the people with whom he transacted his business. For every credit shown on one side of the ledger there should also be a corresponding debit in some other account. If this system were carefully carried out the books would be correct, and all the accounts would balance. The farmers' private accounts should show the payment of accounts grouped under different headings, such as "Household Account," &c. One would then be able to tell at a glance what money was being spent in keeping the house. The account for wages would show the amount of money paid away and the names of the persons to whom such moneys were paid. There should also be accounts for plant, stock, seeding, harvest, fodders, &c., each showing the various items of expenditure connected with the account. In addition to the day-book and ledger a diary could be kept, in which could be entered what the various men on the farm were doing each day, in order that the exact cost of any particular piece of work could be ascertained. At seeding time the number of acres drilled each day should be recorded, also the quantity of seed and super sown per acre. A note should also be made of the yield of each particular crop and paddock, and the firm to whom the wheat was delivered. It was also a good plan to keep a list of the stock on the farm, and to record the dates of the mating of the female stock. A lengthy discussion followed the reading of the paper.

KOPPIO (Average annual rainfall, 22.40in.).

May 20th.—Present: nine members.

HONEY.—Mr. D. C. Gibb, in a paper on this question, said much of the success of the honey industry was due to the invention of the frames for the hiving of the bees. If the bees were confined in kerosine cases and ordinary boxes disease in all probability would follow. During the last 10 years or so the demand for honey had increased considerably, and apiarists were now able to receive a fair price for their produce. Honey was used in many medicinal preparations, and could be given with advantageous results to both horses and cattle. Some of the best classes of vinegar were also produced from honey. He thought those engaged in the keeping of bees should co-operate in order to receive fair prices for the honey. Not only should the co-operation be for the disposal of the produce, but for the bulk purchasing of such materials as were necessary for the bee-farmer. The speaker pointed out that the work of bee-keeping was not laborious, and thought it would make an ideal way for returned soldiers to earn their livelihood. Mr. D. C. Gibb tabled two excellent samples of honey produced from his apiary.

MILTALIE (Average annual rainfall, 14.55in.).

May 25th.—Present: 12 members and one visitor.

CARE OF FARM HORSES.—A warm stable, kept clean and dry, was of first importance, said Mr. O. W. Degner, in a paper on "The Care of Farm Horses." Each horse should be well groomed and have its own set of harness, and particular care taken of the collar, to see that it was kept clean and well stuffed. If the horses became tender footed, they should be shod; but it was not advisable to keep the shoes on for more than six or eight weeks. He favored a medium draught horse for farm work, because it would always bring a fair price if sold, and was more active than the heavier type of animal. Some horses, in spite of the care that was taken of them, developed sore shoulders, and in order to overcome that trouble such horses should be worked with a breastplate. The swingletree should be wide enough to prevent the chains from chafing the sides of the horses. When breaking in a young horse, he should first be driven with a light log attached to chains, and then worked next to the near-side horse of the team. The speaker thought that every farmer should endeavor to breed a few foals each year, to keep up the working strength of the farm. The paper was well discussed, members agreeing with most of the points expressed by the speaker.

MINNIPA.

April 27th.—Present: five members and three visitors.

SCRUB-CUTTING.—There were several points that needed attention, said Mr. McPherson, in a paper on "Scrub-cutting," but first of all one should see that the axe was well prepared. The eye of the axe should be filed down if it had a sharp or rough edge that was likely to damage the handle. It was also a good plan to trim the front and back of the handle with a piece of glass or a rasp if it was too thick. A coat of oil or a small hole drilled in the end of the handle and filled with oil would considerably lengthen the life of the handle. When sharpening the axe the grindstone should always be turned towards the blade. It was only necessary to grind back about half an inch unless the blade was very thick. If an oilstone was occasionally used on the axe it would not need to be put on the grindstone so often. In cutting the tree, one should first cut underneath in order that the tree would break off clean. On small trees up to about 6in. in diameter he did not think it was necessary to take the chips out, for if a few leaves and pieces of bark were scraped together on to the stumps, the chips would burn off with the fire. In cutting large and solid trees it was best to commence with four cuts, two with the left hand and two with the right, keeping the back hand down low and working the bottom cuts upwards, in order that the chips would fly out and there be no danger of the axe becoming jammed. If the tree was cut in that manner the stump would be left rounded off, and implements would be able to pass over them without any difficulty. He did not think it was advisable to burn the trees, because if the leaves and bark were burnt the limbs and stump would not be easily destroyed. It was a better plan to ring-bark the tree and cut it about 3ft. above the ground; a few sticks could then be stacked around the butt and it could be burnt. Candle and box bush could either be cut off rough or knocked down with horses and a log.

At a further meeting, held on June 1st, Mr. A. H. Ralph contributed a paper on "Fencing." He had found that a fence constructed of two wires, one barb and one plain, would keep the stock in, if erected properly. Posts should be placed not more than 15ft. apart, with strainers every 5 chains. Forty-two inches should be high enough for an ordinary fence, with the bottom wire placed about 12in. below the top. If the ground was of a very stony nature, it would not be necessary to put the posts in so deeply. No post should be used that did not measure 4in. at the smallest diameter. He had always found No. 10 plain black wire the most economical to use for fencing. A handy wire strainer could be made by securing a small forked mallee stick about 2ft. in length and then boring a small hole about 3in. from the end. The wire should be inserted in the hole and twisted with the aid of the fork. After a little practice one would soon be able to use the strainer without the use of a plug. For sheep, he considered the best and cheapest fence was made by using 36in. wire netting. The netting should be placed 6in. under the earth after the ends of the roll had been dipped in tar. Besides making a first-class fence, it would also be sheep and vermin proof.

O'LOUGHLIN.

May 22nd.—Present: eight members.

CARE OF IMPLEMENTS.—Before putting the implements away, said Mr. A. E. Boord, in a paper on the "Care of Farm Implements," one should thoroughly overhaul each machine, and take a note of those parts that were broken or nearly worn out, so that they could be ordered in time for the work of the next season. All loose nuts should be tightened, and if the woodwork of the machine was given a coat of paint every three or four years, the implement would last considerably longer. Where the implements were housed in a straw shed he thought the roof should be thatched, and one should see that the fowls did not make the machines a roosting place. The harness should be washed with warm water, and allowed to dry, and then given a good dressing of neatsfoot oil. A small brush was a handy tool to have for applying the oil, as it enabled one to do the work thoroughly. Particular care should be taken of the horses' collars, to see that they were kept clean and well stuffed. A small piece of leather placed under the buckles would

save the wear of the harness, and all repairs should be attended to as soon as possible, either with rivets or by the saddler. Members agreed with the views expressed in the paper, but thought it was a better plan to keep duplicate parts of the machine that cut out quickly. They also thought it was a better plan to repair the harness by stitching rather than using rivets.

SALT CREEK.

May 25th.—Present: 10 members and seven visitors.

BUTCHERING ON THE FARM.—Mr. W. Pulford, who contributed a paper on this question, said to kill a small pig weighing up to 70lbs. or 80lbs. the animal should be held with its back between the butcher's legs, and the left hand placed under the bottom jaw. The head should be forced back and the knife stuck straight in and then pushed downwards. For pigs of a heavier weight he thought the animal should first be shot, and then slaughtered in the same manner. To make the scalding effective, water three-parts boiling and one-part cold should be placed in a fair-sized barrel, and the carcass of the pig moved up and down in the barrel, otherwise those portions of the pig that were against the side of the barrel could not be scraped clean. If the meat was not intended for bacon, it could be cured by cutting into small joints and rubbed with dry salt, and then put in a bag and hung in a cool place. When killing sheep, a small platform should be erected above the ground to prevent the blood and dirt spoiling the skin. After the sheep had finished bleeding, the skinning should commence by cutting the left-hand front trotter knuckle and opening up the skin just below the brisket, and then up to the jaw. Next the shoulder, neck, and inside leg should be treated, and the skin on the brisket pulled back as far as possible. The back legs should then be skinned by opening the trotter down the back of the leg to the tail, and the skin cut away from the purse. Next, the animal should be hung up and the front of the sheep opened and the skin pulled down from the legs and punched off the sides with the hands. When hanging the skins out to dry they should be placed in the shade with the neck and tail on the rail. He thought the best method of slaughtering a bullock on the farm was to first shoot the animal, and then make an incision in the throat and run the knife along the windpipe until the forked vein was reached, which should be severed in order that the blood would thoroughly drain from the body. The cheeks should then be skinned, and the head taken from the body, and the beast placed on its back, in order that the front legs could be taken off at the knees and the hind legs at the hocks. The hind legs should not be severed from the skin. Next the skin should be opened from the neck to the scrotum, and taken from the back leg to the cuphole. The opposite side, neck and shoulder, should then be treated. When the skin had been taken from the body as far down as possible, the beast should be opened and the caul fat taken out. Next the windpipe and scrotum should be freed and the beast hung up. Skinning could then be finished. The hide should then be salted and folded up by turning the outside edges in and doubling over.

TALIA.

June 17th.—Present: eight members.

FLY-BLOWN SHEEP.—The Chairman of the Branch (Mr. P. A. Thompson), who contributed a paper on this subject, said fly-blown sheep during lambing season were always a source of worry and loss to the sheepowners all over the State. One of the first points to be considered in the successful handling of this pest was that of the early poisoning of rabbits. If the rabbits were destroyed later, the results were not so good, and the blowflies did greater damage to the sheep. The ewes that were to lamb during the month of May should be mustered early in March and thoroughly breeched. If it was done later, it would probably injure some of the ewes. If one wished to take further measures, the ewes could be sprayed with carbolic. Last season he had breeched 900 ewes, and had experienced no trouble

with the blowflies. Even where flies were not troublesome, he thought an advantage would be derived by breeching them, because the wool would be kept clean, and thus realize a better price in the market. The meeting also discussed the question of "Weevil in Wheat."

WUDINNA.

May 25th.—Present: seven members.

THE AGRICULTURAL BUREAU.—The first meeting of the Wudinna Branch of the Agricultural Bureau was held at the local store, when the Hon. Secretary (Mr. H. P. Cabot) contributed a paper on "The Work of the Agricultural Bureau," "One of the chief objects of the Bureau," he said, "was to assist the farmers in the growing of the crops, and to help them raise better stock." The speaker pointed out the useful knowledge that was obtained through the medium of the *Agricultural Journal* of the work conducted by the Experimental Farms situated in various agricultural centres of the State. He considered that every farmer should become a member of the Bureau for the purpose of giving and gaining knowledge. Each member should enter into the discussion of the subject before the meeting, and express his opinion for or against the question. The Bureau should appeal more especially to the younger members of the district, for it enabled them to meet with the more experienced farmers and to learn of their success and the reason of failures in all branches of agriculture and stock-raising. It was a privilege to belong to the Bureau, but that privilege also carried with it certain duties such as the regular and punctual attendance at meetings and taking a part and lively interest in the work of the Bureau. One of the benefits derived from being a member was that members were easily put in touch with all the expert officers of the Department. In the event of stock troubles or when any difficulty in connection with their work on the farm arose, a letter to the Department would always receive the prompt attention of the officer especially qualified to deal with that complaint. A paper on "Tilling Operations" was read by Mr. J. L. McMahon, in which he dealt with the depth of ploughing and the preparation of the seed beds. He preferred the use of the share plough to the disc implement, because it enabled one to pull more stumps out of the ground. The speaker laid emphasis on the necessity for the pickling of the seed wheat with bluestone. The paper was well discussed, and the writer gave satisfactory answers to a number of questions.

CARROW, May 23rd.—The meeting discussed the topic of noxious and poisonous weeds, and also the question of the water supply.

YANINEE, May 25th.—Mr. R. Hicks addressed the meeting on the subject of "The Future Prospects of the Wheatgrower of South Australia," and a lengthy discussion followed.

YEELANNA, May 25th.—The meeting took the form of a discussion on various matters of local interest.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES)

BRINKLEY.

April 27th.

CLEARING SCRUB LAND.—Mr. W. Pearson contributed a paper on this subject. In the course of his remarks he stated that it paid to clear the scrub thoroughly, especially if the growth were not very dense. Labor expended in cutting would be amply compensated for by the clean burn secured. For breaking the firmer class of soil he preferred the share plough, but in the sandy soil the disc implement made a

cleaner job. "If the ensuing crop is not thick enough to carry a fire," the paper continued, "a fire rake should be used if there is sufficient to burn. For second crop I recommend oats for the following reasons:—First, you are almost certain to get a good running fire, the value of which it is hard to calculate; and second, a crop of oats is a safeguard against takeall in the event of following on with a wheat crop the third year, but unless it is absolutely necessary for reasons apart altogether from clearing the land, I say, decidedly, oats again; and another good burn would be assured, given a normal season. Then after two crops of oats the land should carry a fair wheat crop, and unless it was apparent that nearly all shoots, or rather stumps, were dead, I would sow it with oats again for the fifth crop—three of oats and two of wheat—and I venture the opinion if the above programme were carried out the desired end would be gained, viz., killing the scrub, with no labor beyond the ordinary cultivation for the crops, which should pay for themselves; and then the land, being clean, and amply seeded by the last crop of oats, would give valuable grazing for two years or more. I ask you to compare that picture—clean land and good grazing, and the land ready for the plough and in good heart for future service in crop bearing—with the picture that meets the eye, look in whichever direction you choose, of hundreds of acres that had been under cultivation several years ago, but have been allowed to revert to infinitely worse conditions than when in a natural state. The land is decidedly worse from every point of view. Rolling, burning, ploughing, and manuring for two or three years may be compared to the treatment usually adopted to renew an old orchard by heavy pruning both above and below ground. If this is so, I think the truth is amply demonstrated by the three to five years' luxurious growth of mallee to be seen today all around on land that with proper treatment would have been adding considerably to the annual revenue of the farm. Now every farmer knows it is easier and cheaper to bring a virgin scrub under cultivation than a young growth of two to five years. I estimate the difference in cost to be anything between 5s. to 10s. per acre in favor of virgin scrub, and 5bush. to 10bush. per acre more wheat on the original scrub; and let it be remembered that the difficulty must and will continue for several years, however vigorous the after treatment may be, as the young scrub, having developed practically a new root system, will stand a lot of hard knocks before it will surrender, and the exhaustion of the soil cannot be restored but by the total destruction of the scrub and the sweetening of the land by cultivation, manuring, and grazing. Thus, if this is a fair estimate of the difference and loss resulting through neglecting to burn and kill the scrub right out during the first four or five years, I think it will be seen that it is the difference between success and failure to the long-suffering scrub farmer."

BRINKLEY.

June 22nd.—Present: 10 members.

CONCRETE FENCING POSTS.—Under this heading a paper was contributed by Messrs. E. L. White and E. G. Humphrey, who stated that with the prospect of timber for fencing posts becoming scarcer every year, it would be a good plan to make cement concrete posts for fencing. To make the posts, the following mixture was used:—Cement 1 part, sand 2½ parts, and gravel 5 parts. In the case of the ordinary fencing posts and struts, the gravel should be small, about ¼in. gauge; and for the larger posts the gravel could be of a much larger size. The dimensions of ordinary posts were 6ft. 3in. x 3¾in. x 3in. at the top, and 5¾in. x 5in. at the bottom. Each post should be reinforced with four pieces of wire, and the holes in the posts made by putting ¼in. rods through the sides and across the moulds the required distance apart. When the concrete had set, the rods were withdrawn, leaving holes in the posts. It was estimated that a man could make about 100 posts a day. Concrete posts did not require special skilled labor to make, they were neat, efficient, and durable, were not affected by white ants or rot, and would not be destroyed in the case of an ordinary grass fire.

CLANFIELD (Average annual rainfall, 16in. to 17in.).

May 25th.—Present: 11 members.

LOWEST PROFITABLE AVERAGE UNDER PRESENT CONDITIONS.—Mr. C. Moyle, who contributed a short paper on this subject, said he would take as an illustration the farmer with 1,000 acres of land on which wheat could be grown; 300 acres of

that area would be under wheat each year, and to sow the same it would take 300bush. of wheat, for which £45 could be reckoned. Fourteen tons of super. would cost £77, rent £120, and wages £130. The living expenses of the farm would depend on the number of persons on the farm, but he thought about £80 would be the approximate cost. Saddler's and blacksmith's accounts would be about £10. If the farmer harvested a crop of five bags to the acre, it would cost £60 for corn sacks. After the seed wheat had been deducted it would leave 1,400 bags for market, at 3s. per bushel, £630. From the above statement the expenditure would amount to £522, leaving a balance of £108 for the farmer.—Mr. A. J. Hammatt also read a paper on the question of "Side Lines on the Farm." Mr. Wilkins, in discussing the paper, gave first place to sheep as the most profitable side line, provided good prices ruled. He thought better returns would be received from poultry than either pigs or cows. Mr. H. Orwell also spoke in favor of sheep, and even with the high cost of fencing material he thought they would soon pay the cost of the erection of the fences. Mr. F. Moar advised the keeping of sheep, and he thought that cows and pigs could also be kept profitably. Messrs. Moyle and Cockshell also spoke, and the members unanimously agreed that sheep were the most profitable side line.

CLAYPAN BORE (Average annual rainfall, 16in. to 17in.).

April 22nd.—Present: five members and seven visitors.

FARMING IN MALLEE COUNTRY.—Mr. Robinson, in a paper on this question, said in order to obtain the best returns from a farm in the mallee districts one should combine various side lines with the growing of wheat. If one decided upon keeping sheep it was important to see that they were provided with an abundant supply of water, and that the fences were in good order. As the material required for the sinking of a bore was very expensive, he thought dams should be excavated in each paddock. If the holding comprised an area of 1,000 acres, 300 acres could be fallowed, 300 acres under crop, and 300 acres left for pasture. Of the remaining 100 acres, 10 acres could be set aside for the homestead and surrounding buildings, 60 acres for hay, and 30 acres for green fodder such as barley or oats. He thought it would be a good plan to have several small paddocks close handy to the homestead where cows, pigs, and poultry could be kept. Much depended upon the working horses of the farm, and the farmer should see that they were properly cared for. The seed wheat should be of a clean sample, and used at the rate of 30lbs. to the acre with 80lbs. to 100lbs. of super. Before commencing hay-making and harvesting operations it was a good plan to see that all the implements were in thorough working order, and to keep them under cover when not in use. In conclusion, he pointed out that a garden would add to the attractiveness of the farm, and also provide the homestead with a supply of fresh fruit and vegetables.

CLAYPAN BORE (Average annual rainfall, 16in. to 17in.).

May 27th.—Present: 10 members and one visitor.

CARE OF WORKING HORSES.—In a short paper under this heading, Mr. Northcott said that if farmers wished their horses to work well and keep in good condition, they should be well fed and provided with a warm, dry stable. Before commencing work they should be thoroughly groomed, and he favored the plan of having water in the yard, in order that the horses could have a drink whenever they felt inclined. A supply of rock salt in the manger, and a dose of Epsom salts about once a month, would help to keep the horses in good condition. When being fed out in the paddock, the team should have bran or pollard mixed with their feed. The regular feeding of the animals was also another important point in keeping the horses in good health. Careful attention should be paid to each horse's collar, to see that it was kept clean and in good order. A small paddock with a good growth of green feed in it should be reserved for the horses, into which they should be turned every week-end. A good discussion followed the reading of the paper, members agreeing with the views expressed by the writer.

GERANIUM (Average annual rainfall, 16in. to 17in.).

June 2nd.—Present: 10 members and three visitors.

SCRUB FARMING.—Mr. Logg, in presenting a paper entitled "Suggested Methods of Working a Scrub Farm," mentioned, as the primary point, the rolling of the scrub. He advised rolling the scrub north and south, with the aid of a ribbed roller. Whilst it was much better to cut the springbacks, if time did not allow of that, it would be quite possible, after a burn, to plough the land with a disc implement. The ploughing should be to a fair depth, thus securing a greater depth of sweetened soil for the subsequent season. If the ground were just scratched over the first year and in the second year ploughed to any depth, with no fire to assist, the soil would be too sour. The second year's crop should be wheat. For the third year's crop, oats should be sown, about 1½bush. of seed, with 60lbs. of super., to the acre being used. It was necessary to sow a crop of oats, not only for horse feed, but because that cereal was not affected by takeall, and also to secure a good burn that would destroy the mallee roots. When seeding was finished, the share plough should be started, with plenty of draught on the machine, and ploughing to a depth of about 4in. Next, the harrows should be run over the ground to bring the stumps to the surface, and the land again worked with the cultivator, in order that the sun would be able to sweeten the soil and to prevent the surface of the land from setting hard after the rain had fallen. After the cultivator had finished, the land should not be touched until after harvest, when, if there were any weeds or rubbish on the fallow, the harrows or cultivator should again be run over the land.

KI KI.

May 25th.—Present: eight members.

FARM HORSES.—In a short paper on this question Mr. J. Young said in selecting a team of horses for farm work he would choose five heavy draught horses about four years old. It should be seen that each horse was provided with a well-fitting collar. The animals should be groomed every morning, and special attention given to their shoulders. Four feeds a day were necessary. He did not think it advisable to give them too much corn, as that overheated the blood and caused boils to break out. Oats and cocky chaff with a little bran would make a satisfactory food for the horses. When young horses were being worked they should not be harnessed longer than half a day. The team should be trained to go steady through a heavy pull of sand. The stable should be kept warm and clean, and water provided for the horses so that they could drink whenever they felt inclined to do so. Mr. Redman also spoke on the best method of handling colts.

MERIBAH.

May 22nd.—Present: 12 members and five visitors.

DISEASES OF WHEAT.—One of the most common diseases of the wheat plant, said Mr. Munday, in a paper dealing with the "Diseases of Wheat," was that commonly known to the farmer as smut. The disease was a parasitic one, because the fungus lived on the wheat plant, and took the sap that was necessary for the production of strong healthy plants; consequently it would be readily understood that if farmers failed to take precautions to guard the seed against an attack from that disease, the grain harvested would be affected to a considerable extent. In South Australia the farmer had to deal with three kinds of smut, namely:—Bunt or stinking smut (so called because of its offensive smell), loose smut, and flag smut. He considered the first named to be by far the worst form of the disease, because it formed in the ear of the wheat plant, and was reaped with the sound grain. During threshing operations the smut balls were broken, and the grain became dirty in color, and naturally affected the sample if desired for milling purposes. The spores of the disease were contained in the chaff of the wheat plant, and if harvested with grain not so affected, all the seed would become diseased. There were three periods in the history of the disease when it might be

possible to destroy it and prevent its injury to the crop. First, after the spores had germinated and before the mycelium threads had entered the young plants; secondly, while the wheat plant and bunt were both growing together; and, thirdly, when the bunt spores were on the grain ready for seeding. Neither during the first or the second periods mentioned was it practicable to take steps to combat the disease, but with the third there were several simple remedies at the disposal of the farmer. It was necessary to obtain something that would kill the fungi, but at the same time care should be exercised to see that the germination of the grain was not affected. One treatment consisted of dipping the grain in water heated to a temperature of 130deg., and leaving it there for 10 minutes; but as very few farmers had the apparatus necessary for keeping the water at the correct temperature, he did not recommend the adoption of that method. 1lb. of bluestone dissolved in 10galls. of water would make a solution strong enough to destroy the fungus, and at the same time it would not affect the germination of the seed. The grain could be pickled on the floor by using 2½galls. of the solution to each bag of wheat, and turning the seed over thoroughly by using a wooden shovel, or by immersing half a bag of wheat into a cask of the solution. He had found that if the seed was left for a while before sowing, it would germinate much better than if sown as soon as pickled. Another liquid used to a large extent was formalin, and to be effective it should be used at the rate of 1lb. in 40galls. of water. Grain treated with that preparation should be sown soon after pickling, otherwise the germination of the seed would be affected. The writer also dealt with loose and flag smut. A long discussion followed the reading of the paper, the consensus of opinion being in favor of the bluestone solution and the practice of pickling the seed in half bags.

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

May 25th.—Present: 21 members and two visitors.

SWINGS AND EQUALIZERS.—Under this title a short paper was contributed by the Hon. Secretary (Mr. C. F. Altmann). For the manufacture of good, strong swings, the writer said, he preferred the use of sound sheoak wood and large links. Eyebolts were inclined to work loose and pull out of the wood at either end of the swing. On ploughs and other implements of a similar nature he thought spreaders gave better service than swings. When working a six-horse team he had the spreader wide enough to accommodate three horses on either end. By using a spreader and iron equalizer, the tackle would not be nearly so heavy as in the case of all wooden swings. When more than six horses were used, he preferred to work the team in the form of a tandem, and placed pulleys about 5ft. forward from the swings, and then ran a chain from the leader over the pulley and hooked it into the hame of the body horse. If the leading chains were of a reasonable length, there would be very little weight on the necks of the body horses. Backbands should be harnessed to the body horses, to prevent the chains from dropping down at the turns. It was also essential to work bellybands on the leading horses of the team. He had seen pulleys worked from the hook on the swing, but while that had the same equalizing effect as the plan mentioned above, it had the disadvantage of requiring very long chains.

MORGAN (Average annual rainfall, 9.29in.).

May 25th.—Present: six members.

PROFITABLE POULTRY KEEPING.—The Hon. Secretary (Mr. W. F. Plummer) initiated a discussion on this question. He pointed out that if one wished to be successful in keeping poultry, the following points should be observed:—No hen should be kept for a longer period than three years. Roosters should be kept in separate pens, and sent to market when full grown. Care should be taken to breed only from those hens that had proved themselves prolific layers. The selection of good roosters for breeding purposes was also important. Mr. R. Wohling had received good returns from breeding large table fowls, irrespective of their being good egg producers.—Mr. Plummer tabled an early prickly cucumber weighing 6¾lbs.

MYPOLONGA.

June 19th.—Present: 19 members.

ANNUAL MEETING.—The Hon. Secretary (Mr. A. Wiadrowski) presented the annual report, which showed that 11 meetings had been held, with an average attendance of 14 members. The election of officers for the coming year then took place.

NUNKERI AND YURGO.

May 5th.—Present: eight members.

FARMING IN THE EASTERN MALLEE.—The meeting of the Branch was held at Mr. H. Sanders' residence, and after an inspection of his holding he read the following paper on the above question:—"When allotments in this hundred were granted in 1911 and 1912, it was expected that wheat-growing on them would be a payable proposition, but experience has proved otherwise. The land itself is of the poorest quality, so that holders had no opportunity of preparing for the inevitable dry year of 1914. Other causes also have tended to make wheat-growing unprofitable—the upheaval in Europe, bad roads, and the high and always increasing cost of production without a corresponding increase in the price of wheat. Further than this, it was expected that the district would show an immediate return for moneys expended, but such has not been the case, and consequently a number of blocks have been thrown up in a half-cleared condition. This means that these blocks have become a harbor for vermin, and have reverted to worse than their original condition, the half-grown shoots and undergrowth being much more difficult to deal with than virgin scrub. Therefore it is clear that prompt action must be taken to stop the drift, and to prevent the money and energy expended from being thrown away. In view of these circumstances the best course for those who are left to pursue is to go in for a system of mixed farming. The first point to be considered is that it takes at least five years to get the upper hand of the scrub and undergrowth which springs up when the mallee is cleared. After that the question arises, 'What crops should one grow, and what class of stock is most likely to prove a source of profit. Let us consider cattle first. The high cost of fencing, combined with the exorbitant price of cattle, at once puts this line out of the question. Dairying, of course, cannot be considered in view of the scarcity of labor and the absence of irrigational facilities. There remain, therefore, sheep and pigs. Most of the occupied blocks have from 600 to 900 acres partly cleared, and the sheep-proofing of this area would be a big item, to say nothing of the cost of the sheep. The lot would run into about £400, but after the first outlay there would not be much further expense. Sheep do well in this class of country, although in some years it would be necessary to hand feed during May, June, and July; 75 bags of oats and a supply of cocky chaff would easily keep 100 sheep going over this period. The cost of feeding would be roughly £20, and interest on capital at 6 per cent., equal to £24. The return from 100 ewes should be about £150, and to this must be added the benefit derived by the land. Sheep work wonders in freeing the land of bushes, pig face, white and yellow daisies, and other plants that no other stock will touch. Probably this in itself would more than cover the cost of feeding and interest on outlay. With regard to pigs, the first cost would not be nearly so large as with sheep if they were treated as they should be. Twelve good sows and a boar could be bought for, say, £90, and cost of fencing would be about £50. Two barbed wires low down will keep a contented sow in a paddock. The sows can be run on stubbles and grass all the time they are not rearing pigs, and they will keep in better health and condition than if kept in a sty. Before farrowing the sows should be locked up and given plenty of good feed, wheat, barley, and pease with milk and pollard if available. This will give the young pigs a good start. If they are to show a profit they must not suffer a check at any time. In commencing operations in this class of country a good plan would be to grow two crops of wheat, then one of barley or oats, then one of pease. If a stubble burn can be obtained this will be half the battle. Either pigs or sheep will attend to the grain on the ground, very little indeed will be wasted. They will do best of all on the pease, and that crop seems to encourage the growth of grass. The nitrogen stored by the pease seems to be just what this class of land requires."

NUNKERI AND YURGO.

May 27th.

FODDER CROPS SUITABLE FOR MALLEE LANDS.—The Superintendent of Experimental Works (Mr. W. J. Spafford), in an address on the above subject, said it was rather a difficult one to deal with, in view of the lack of proper clearing and the almost complete absence of proper fencing. The high price of fencing material which was likely to remain so for some years, made the growing of fodder crops rather a doubtful proposition on poor country, since the success of fodder crops depended largely on the farmer's ability to move the stock at frequent intervals from one field to another. The most valuable of all fodder crops for local conditions was, without doubt, lucerne. That plant was hardy and quick growing, and stood any amount of feeding off once it had got a hold. It was relished by all stock, and possessed a high fodder value, and being a legume, improved the land for cereal crops. The amount of seed required under local conditions would be from 4lbs. to 6lbs. per acre, and could be sown with a cereal crop, preferably one that was intended for hay. The lucerne would then be cut with the hay early in the summer, and would be better able to stand the hot weather. If sown with a crop that was to be stripped, teams and implements breaking down the stubble, left the lucerne exposed to the summer heat, and after having been shaded for so long, a large proportion of the plants might be killed. The life of grazed lucerne in that district would be about four years, perhaps longer. It would not be wise to rely on more than four years' feed from it; but that would suit very well if cereal crops were only grown in a five or six years' rotation, the plan of rotation being—(1) Bare fallow, (2) wheat and lucerne, (3) lucerne, (4) lucerne, (5) lucerne. Tall fescue would make an excellent fodder crop for sandy country. It was hardy, a strong grower, and stood feeding off very well. Its feed value was high, and it was palatable to stock. Its life would be from three to four years. Bokhara clover was another fine fodder. It was hardy, and would adapt itself to sandy country. Stock liked it, and its feeding value was good. It was also a strong grower, and stood any amount of feeding off. Prairie grass would do well on sand. It was a vigorous grower, and had a wonderful capacity for seeding and spreading. It was palatable to stock, and stood much feeding off. Its fodder value was good. Sheep's burnet was a useful fodder, although only of fair feeding value. Evening primrose would be useful in a sandy district, although it was rather difficult to get a thick crop of it. It shot up very quickly, but might be found to be rather thin. Italian rye grass would be found suitable for the better patches of country, although it would not do well on sand. It liked stiff, hard ground, and would stand plenty of water. It often did better on the roadside than in the paddock, because here the soil was well packed together. Rape was a fodder much esteemed in South Australia, although it would require to be sown each year. It was necessary to drill it in before the first rains, and, of course, much of the success of the crop depended on when the rains came. If early enough, rape would provide a fine body of feed in a few weeks, and would carry a lot of stock during its growing period. Peas made an excellent fodder crop, and were also a soil improver. They should be sown fairly early in the season. Some farmers turned the stock on to them as soon as the pods formed; but possibly the best results were obtained when stock were kept off until the seeds had begun to harden. If not fed until quite dry, either sheep or pigs could be turned on, and would find all the peas. A most useful fodder crop in mallee districts was a mixture of oats and rye. They could be sown early, with, say, half a bushel of each, and a heavy dressing of super. would be of benefit. Rye was a very quick grower, and did well on the poorest land. It shot up quickly, and provided feed when the oats were creeping along the ground. When the rye had served its turn, the oats would be shooting up, and in spite of the reputed bitterness of oats, stock would take to them readily enough, and would also do well on them. For fodder it was advisable to sow thickly, a thick sowing having the effect of making the plants shoot up quickly. Both oats and rye stood a great deal of feeding off, particularly the latter, although when it got too far forward it became too hard for stock. Cape barley made a fodder much esteemed by some farmers, although hardly equal to oats and rye. It was a strong grower, and stood a good deal of feeding off. It could be mixed with oats and rye if preferred. Mr. Spafford then dealt with methods of cultivation suitable for sandy districts. The first consideration in handling mallee land was not only to

kill the shoots and bushes, but also to get rid of the roots. No system of farming could be successful while the ground was full of roots. They were a prolific cause of takeall, common enough in all mallee country. The roots decaying in the ground left numerous air spaces, and when the roots of the wheat plant encountered these air spaces, the plant was badly checked. Also, no implement could do satisfactory work over stumpy ground. It had to be borne in mind that sandy land would not stand continued cropping, mainly owing to the deficiency of organic matter. One crop of wheat in five years was enough for it. The rotation, therefore, would be—Bare fallow, wheat, and then grazing for the remainder of the term. That might, perhaps, be varied by following the wheat with a crop of oats. Bare fallowing, of course, was necessary, in order to conserve moisture, to destroy weeds and rubbish, and to assist bacterial action in the soil. Ploughing should be done as early as possible in the winter, the earlier the better, and rolling after the plough would be beneficial. The wheat plant liked a firm bottom under the seed bed, and for that reason, if fallowing was late, which meant that fewer opportunities for cultivating would be available, shallower ploughing would be required. The success of fallow depended entirely on the working after the initial ploughing. To retain the moisture, it was necessary to keep the surface loose. The loose surface also had the effect of quickly soaking up any rain that fell. The principle of the surface mulch could be illustrated with a sponge and a brick. If a sponge full of water were placed touching a brick, it would be found that the latter would soak the water from the sponge. If, on the other hand, a dry sponge were placed on a saturated brick, little or none of the water would be transferred to the sponge. Therefore the mechanical state to be aimed at when preparing fallow was a firm, well packed bottom and a loose surface. The moisture in the soil was actually in the form of a film of water extending from the surface downward. Therefore, when evaporation took place, the surface of the film was thinned, and it drew from the bottom until the whole moisture content would be exhausted. To check evaporation, cultivation of the fallow was necessary. That had the double effect of breaking up the film of water and aerating the under soil, and a certain amount of air was necessary for the bacteria which were at work beneath the surface. Cultivation would be required after every fall of rain heavy enough to form a crust on the surface, and also, perhaps, to kill any rubbish that might have germinated. Therefore it was likely that one would have to go over the land several times between the first ploughing and seeding. It has been contended that dry cultivation was a cause of takeall; but that was not correct if carried out with intelligence. As a rule, there was nothing to be gained by dry cultivation, and on sandy land it was likely to cause more drift than otherwise would have been the case. There would always be a certain amount of drift on a well-worked sandy fallow, which drift was entirely due to the absence of organic matter in the soil. As a general principle, each cultivation should be slightly shallower than the preceeding one, the final working being as shallow as possible—not more than 1½in., and just sufficient to make a proper seed bed.

PARRAKIE (Average annual rainfall, 16in. to 17in.).

June 1st.—Present: nine members and four visitors.

GARDENING ON THE FARM.—Mr. H. Henning contributed a paper on this subject. The speaker, in his opening remarks, said every farmer should endeavor to lay out a small fruit and vegetable garden, for besides providing the homestead with a good supply of fresh vegetables, &c., the appearance of the holding would be considerably improved. During the first years one would not derive much benefit from the fruit trees, but when they commenced to bear one would be amply repaid for any trouble that might have been undertaken. The speaker also dealt with the pruning of the trees. Provided one could obtain a good supply of water, he thought they would be able to grow almost any variety of vegetable in that district. The paper was well discussed, and all members agreed that each farmer should have a garden adjoining the homestead.

PARRAKIE (Average annual rainfall, 16in. to 17in.).

June 22nd.—Present: eight members and one visitor.

THE CARE OF PIGS.—Mr. H. Diener, in a short paper on this topic, said every farmer should keep a few pigs on the farm. The pigs could be fed on most of the by-products of the farm, and quickly fattened for sale in the market. He thought

the pigs should have a small paddock to run in, because they kept much healthier. Milk was one of the best foods for the pigs, especially if fed with crushed wheat, barley, or pollard, and it was also necessary to provide them with a good supply of fresh water. He had obtained best results from the Yorkshire pig. Animals of that breed were quickly fattened, and dressed to a good weight. He felt sure that with care and attention the pig was one of the most profitable animals to keep on the farm.

POMPOOTA.

April 17th.

DAIRYING.—Mr. A. Clark, in a paper on this question, said:—"It is advisable to purchase the best cow your cash will permit, as a good dairy cow will not eat any more food than a bad one. A cow at about the second calf is a profitable one to buy. The Jersey is recommended as the best butter cow, but we have had some splendid Shorthorns. The latter are a good hardy sort, and as a rule give good milk and butter yields. If the calf should be sold it would bring a good price in the market, and when the cow has finished her milking days she will fatten up well and return a good price from the butcher. The Shorthorn cow is generally quiet and good tempered, has nice teats, and is fairly easy to milk. Of course one needs to be careful to get a cow with a nice even udder, and teats evenly placed. When the cow has been selected it is desirable to obtain a well-bred bull. Always remember that the bull represents half the future herd. Give the cows a change of paddocks occasionally, as the feed then has a chance to sweeten and freshen up. A good plan is to have two or three paddocks, and give cows four of five days in each. The feed should not be allowed to get rank and strong, otherwise it will affect the cream. Some people object to feeding the cows while milking, but I find that they appear to be more contented, and give their milk down more freely. I strongly recommend feeding chaff and bran during the cold winter months just slightly damped with water, and green feed for the summer months. During my 14 years' dairying I used chaff and bran and green feed and was most successful. Cows need a good supply of clean water in the paddock and if possible in the yard, where they can always help themselves. When yarding the cows always drive them from the paddock to the yard quietly, and at a walking pace, and then let them stand for a few minutes before starting to milk. Let every cow have her own position in the yard, and always start milking morning and evening at the same time. Milk each cow in rotation. Each milker should have a bucket of clean water and a cloth, and wash the teats clean, as there is always a certain amount of dust or dirt about the udder. He should wash the hands after milking each cow. It is cleaner for the milker, and prevents the spread of teat troubles. Sometimes when starting to milk one nipple will appear blocked up. Put a gentle pressure on the teat, a little vaseline on the palm of the hand, and rub gently on the nipple. Possibly a white stringy substance will appear. Work that out with a gentle pressure; never put the finger nails against the nipple, as they may poison it and possibly cause the cow to loose a quarter. If a quarter should become hard bathe it well in hot water and rub with ointment or vaseline. Sometimes a good rubbing with oil will be effective. Always milk a cow fast with a good, firm, gentle pressure. The following points should be avoided:—Never ill-treat the cow in the bails or out of it. Never use the milk of a freshly-calved cow for at least three or four days, but give the milk to the calf. A few hot bran mashes are good for a cow that has just calved. If the afterbirth does not leave within a couple of days attention is desirable by an experienced person. As soon as milking is over separate, or if there are two or three hands, let one start just before the milking is finished. Keep the milk up to a temperature of about 98deg. The machine makes cleaner work with the milk warm than when it is cold, and always try to have the milk the same temperature each time of separating, and turn the machine at the same pace. Do not put the separator together until you are ready to use it. Do not flush the separator with hot water, but put about half a gallon of separator milk to rinse out any cream that may be left Immediately afterwards take the machine apart, rinse in cold water, which makes it easier to wash than with hot water, and then finish with a little cold water. Dry all parts with a clean cloth, and hang them up in a well-ventilated place. [illegible] small quantity of milk.

Clean out the cow bails and yard every day. It is better for the milk, and more comfortable for the man. When the cans come from the factory scald them out well with water, and place them on their sides with the lids off in a ventilated, airy place. When required for use rinse them out with hot water and then a little cold water. Be sure and have a clean vessel to receive the cream from the machine; cool the cream, and do not mix with other cream until the following day, then, when mixing, stir well every time. Have the separator set so as to run the cream to a consistency of 2lbs. of cream to 1lb. of butter, then a 5gall. can will give about 25lbs. of butter. Always keep a clean piece of cheese cloth over the top of vessels that contain cream to keep out flies, blowflies, and mice. Never keep cream in a room with cheese, vegetables, or fruit, in fact cream should have a room entirely to itself. Do not keep cream in a cellar in the winter as it is too close, and causes the cream to become mildewed and stale. In summer always keep the cream as cool as possible. A good plan is to get a clean wheat sack, open it down both sides, and wet it well in cold water, and wrap round the can. This done morning and evening will keep the cream in excellent condition until you have sufficient to send to the factory. After sundown stand the cream outside (weather permitting) and bring it in again early in the morning. Send the cream at least twice a week to the factory. In hot weather, for long distances a wet bag should be placed round the can of cream; the factories will always send the bag back. Thousands of pounds sterling is lost in South Australia yearly through careless handling of cream on the farm. The factory can never satisfy a supplier that sends inferior cream. Dairying properly managed and attended to is a paying proposition."

On May 1st an address on the subject of "High Land Irrigation and Cultivation" was delivered by the President (Mr. C. W. Hynes). He said two of the items of the subject of his address were practically inseparable, namely, irrigation and cultivation, if one wished to obtain the best results. The trouble of salt was caused in most cases by too much water in the subsoil and rapid evaporation followed if the land was not thoroughly cultivated. Some irrigationists applied from 6in. to over 1ft. of water per acre, and the trees and vines seemed to thrive for a time under that treatment, but if that method was continued the results would be the reverse of beneficial. Very often harm that could not be repaired would follow, not only to the man himself, but to his neighbor, who might be working his land on correct lines. Cultivation was often neglected at the outset, at which time it was most essential that as much as possible should be given the land. The first ploughing should be as deep as the nature of the soil would permit. Crops sown for green manure should be sown about the beginning of April. For cover crops in orchards or vineyards various kinds of plants were suitable. He preferred pease sown with about 1cwt. of super., though many growers used oats, barley, tares, and cow pease, as they all supplied nitrogen to the soil. The crop should be so sown that sufficient room was left to work a single-horse implement between the rows of trees or vines. In the event of no cover crop being sown, ploughing should be commenced about May, and the land left in its rough state during the cold months in order that it would receive the beneficial action of the frosts. Ploughing should be done to a depth of about 7in. or 8in., but here again the depth depended on the nature of the soil. In orchards, among trees and bush vines, cultivation could be carried on in a slightly different manner, though the principle was the same as in trellised vine cultivation. In ploughing land among trees and bush vines, the first ploughing should, if possible, be across the way of watering, and the next ploughing the opposite way, so that the furrows would be in the same direction as watering. Before cross ploughing, all the land should be worked down, and all dead furrows and finishes obliterated to prevent the water breaking out of the furrow, and thus upsetting the irrigation. One should endeavor to plough the land when in a moist condition, most of the weeds would be covered, and the implement did much better work. Next the cultivator or harrows should be run over the ground across the furrows if there was no danger of uncovering the weeds. The land should be left until the weeds and rubbish had rotted, when it would be ready for further cultivation, taking care not to plough too deeply. That would prepare the soil for the next and deeper working, when the cultivator could be set deep enough to reach the bottom of the ploughing. That would make the soil more capable of holding moisture by preventing evaporation. In vineyards, pruning would take place just after that ploughing was finished, and where crops were sown for green manure.

He had always followed the practice of starting the ploughs as soon as the leaves fell from the vines, and ploughing every alternate row as closely as the growth of canes would permit, leaving the other rows unworked, because of the difficulty of raking the canes on the ploughed land. In that case, if it was intended to sow manure crops they should be sown in every other row. After the pruning and raking out was finished, the remaining rows could be ploughed. When within 2ft. or 2½ft. of the vines the depth of ploughing should be made less or injury might be done to the roots. The vine hoe should then be worked, and the small strips of land under the vines worked. Harrowing or light cultivation could then take place to break up the surface of the soil, after which the furrow left by the vine hoe must be covered. That might be done with either the plough, vine hoe, or disc. The vine hoe would do it well if there were not many long weeds mixed up in the soil, in which case the discs answered the purpose well, being set to throw out hard in order to put the soil far enough out to be met by the soil coming in on the other side, thus making a slight ridge of loose earth. Where the vine hoe was used to put soil back it should be used once only, the plough being used next, when there was room for a horse to work. If the ground was not suitable for either hoe or disc the plough might be set to throw right under, and the work continued to about three furrows up and down the rows, leaving a furrow around each row of vines through which to water. Watering would shortly be necessary unless the season had been wet enough to do without watering. It should always be remembered that in places where one had to wait for water it needed a heavy rainfall to take the place of irrigation. Irrigation was commenced by ploughing out furrows in the direction the water would flow from the pipes into the channels. The furrows should be about 3ft. to 4ft. from the trunks of the vines or trees. In the case of young trees they could be put closer. One most important point was the rate at which the water was allowed to run. On such blocks as they had in that district, which were of a fair grade, the water should be allowed to soak, and to gain that end, it should be run slowly. In long furrows the watering could be finished off quickly by allowing more water to come out of the spouts. The soakage from the already well-watered high land would find its way down to the lower end, and make a flood at the bottom unless the irrigation was finished off quickly. That flooding at the lower ends of the blocks was most undesirable from every point of view. Flooding made the land set hard and dry out more quickly. If working in vines planted in rows and trellised it was impossible to get through with cultivators, and before the flooded part was dry enough to work one would find the higher part already dried out and the moisture evaporated. In the case of trees or bush vines, where the implements could be worked across the furrows, the flooding was perhaps not so serious a matter, as the cultivation could take place on the higher part and work down to the lower end, and would give the flooded land a chance to get dry enough to carry a horse and implement. Apart from the disadvantage of holding up the whole block as regards cultivation among trellised vines, the action of the flood water was not beneficial. It might appear to be giving good results for a time; the vines or trees might respond to the treatment, and possibly show a good vigorous growth, but if continued that treatment would eventually end in ruin to the trees or vines. It should therefore be remembered that less water and more cultivation were needed. It might happen that a heavy rain would follow when the block had been watered and cultivated. In that case the land should be worked again as soon as it was dry enough to permit the implements to get on the land. Heavy rain would pack the surface and cause evaporation, and unless the surface of the soil was broken up many of the good properties would be lost. Weeds also would follow the rain, and unless dealt with promptly would afterwards cause trouble. Disc cultivators were much used by growers, and they were very good implements, but they were too frequently allowed to take the place of the plough. The disc implement by its scraping action left a hard bed or pan just under the surface, and that facilitated evaporation. For cutting up pease sown for green manure the disc did good work. When irrigation was finished the furrows should be closed up as soon as the land would carry a horse and implement. Furrows left open for any length of time allowed the water to dry out of the soil. A scuffler or single-horse cultivator was the best implement to use for the closing of the water furrows. It was run with the wheel in the furrow, the tines at the front breaking up the bottom and sides, and the rear tines covering and completing the operation.

On May 17th the Superintendent of Experimental Work (Mr. W. J. Spafford) addressed the meeting on the question of "Tillage and Tillage Implements." On May 22nd the Branch holds its second annual meeting, when the Hon. Secretary (Mr. P. B. Thomas) tendered a report of the work of the Branch during the past 12 months, and the election of officers followed.

POMPOOTA.

May 22nd.—Present: 24 members.

ANNUAL MEETING.—The Hon. Secretary presented the second annual report of the Branch, which showed that 17 meetings had been held, with an average attendance of 33 members. The election of officers also took place. On May 29th Mr. H. J. Darwent (Orchard Inspector) gave a demonstration and lecture on the "Pruning of Deciduous Trees." At a further meeting, held on June 5th, members discussed the question of "Swamp Land Cultivation and Irrigation."

POMPOOTA.

June 12th.—Present: 39 members.

Mr. M. O'Callaghan gave a paper on "Onion-growing," in which he dealt with all phases of the cultivation of the onion. At a further meeting, held on June 19th, the question of "Weevil in Wheat" was discussed.

RAMCO.

May 20th.—Present: 13 members.

FEEDING HORSES.—In a short paper under this heading, Mr. F. Kotz said the horses should be given four feeds a day, consisting of chaff, crushed oats, and bran, and a handful of salt once a week. The horses should be fed in the morning, midday, then at 6 o'clock, and finally about 9 o'clock. The stable should be kept clean and warm, and the horses groomed down with a brush and damp cloth. A good discussion followed, in which most members thought that the feed recommended in the paper was very good, but on most of the blocks in that district the horses were not worked very hard for any length of time, and consequently they did not think it advisable to feed the horses all the year round.

ROSY PINE.

May 21st.—Present: 11 members.

FODDER CROPS THAT IMPROVE THE SOIL.—Mr. W. Townsend, in a paper under the above title, said rape was one of the best fodder crops to grow, because the stock were very fond of it, and after being fed down, it could be ploughed into the soil, as it contained a large quantity of organic matter, which had a very beneficial effect on the physical condition of the soil. It also further acted as a stimulant on those organisms in the soil which were so intimately associated with fertility. By ploughing the green fodder under there was rendered available for the succeeding crop a supply of excellent plant food, which was very necessary for vigorous development. The crop sown after the rape would greatly benefit, because of the cleaning effect the rape had on the land. A large number of sheep could be carried where rape was grown, and the manure from the sheep would also benefit the land. Crops that were sown in rotation with fodder crops, particularly rape, stood very little danger of suffering through the fertility of the land having become exhausted. Any piece of land that required building up should be sown with rape, and sheep allowed to run on it. The sheep would quickly fatten, and the land would be benefited to a considerable extent.

BERRI, June 19th.—The annual report was presented by the Hon. Secretary (Mr. W. R. Lewis), and the election of officers took place.

COOMANDOOK, June 1st.—The meeting discussed various matters of local interest.

MURRAY BRIDGE, May 21st.—The Government Dairy Expert (Mr. P. H. Suter) attended the meeting and delivered an address on "The Keeping of the Dairy and the Proper Treatment of Dairy Cows."

MYPOLONGA, May 29th.—The delegates to the Conference at Berri gave a full report of the proceedings, and an interesting discussion followed.

WILKAWATT, June 1st.—Mr. A. J. McAvaney delivered a short address on the rabbit pest, and members expressed the opinion that unless something was done to cope with the pest, the coming season's crop would be seriously affected.

SOUTH AND HILLS DISTRICT.

ASHBOURNE.

May 27th.—Present: 15 members.

WHEAT-GROWING.—A paper on this subject was contributed by Mr. A. G. Forrest, in which he described the tilling of the ground, the sowing of the seed, and the reaping and harvesting of the crop. Mr. Forrest described his experience with the different varieties, and enumerated the different wheats suitable for early, middle, and late sowing. A discussion on the pickling of wheat then took place.

At a meeting held on June 6th, the Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) gave a lecture and demonstration before a large attendance of members and visitors.

ASHBOURNE.

June 24th.—Present: 14 members.

ANNUAL MEETING.—The Hon. Secretary (Mr. J. H. Potter) presented the annual report, which showed that since the inauguration of the Branch, in December of 1917, nine meetings had been held, with an average attendance of 17 members. The election of officers followed, and a discussion on "Weevil in Wheat" concluded the meeting.

BLACKWOOD (Average annual rainfall, 27in. to 29in.).

May 20th.—Present: 13 members and three visitors.

VEGETABLE-GROWING.—Mr. P. H. Williams in a paper on this topic, said vegetable-growing, although perhaps the most widely practised branch of horticulture, was but indifferently understood by most people; and even many of those who grew vegetables for a living did so in a haphazard sort of way. People in and around the city could practically insure success by getting the ground in good order before the rain fell. That was a very easy matter where water was cheap and plentiful, and all that was required was to give the ground a good soaking, say, from 3in. to 5in. of water, according to the condition of the soil, about the end of March; but care should be taken to get the moisture down at least 2ft., and at the same time one should be careful not to sodden the land. In treating land in that way, it was best to give it a rough digging, and let it stand for three or four days, and then break it down to a fine surface; it would then be an easy matter to keep it in good order. It was seldom that the first rains went very deeply into the soil, and as the moisture was drawn from both the surface and underneath the ground, it would be soon noticed that unless followed by more showers, the moisture would disappear, and if the plants did not die, they received a bad check, from which some of them would never recover. Another item upon which much depended was the seed selection, and that, to most people, presented a very grave problem, for it was not everyone who could save their own seeds, and bought seeds could not always be relied upon. As an instance of that, three years ago he bought 2galls. of Canadian Wonder beans from an Adelaide seedsman, and when they came into bearing they

turned out to be what were known to gardeners as "niggers." While resembling the Canadian bean, they were of a stunted growth, with small pods that became yellow and tough as soon as they matured. Plants soon degenerate if grown too long in one place; it was therefore necessary to sometimes change the seed. Some people had an idea that fresh seed should be saved every year, but it was not always wise to do so, because many seeds improved with age. Some would grow many years after picking, if kept dry, and if one had any extra good plants, the seeds should be saved and kept as reserve stock. In sowing seed great care should be taken to see that there was no plant about that would interfere with the seed plants, otherwise seed selection was a waste of time. As an instance of that he cited a case where a gardener had a splendid sample of red radishes that he had grown from careful selection, but last season he had allowed a few white ones, that escaped notice for a time, to flower near the seed plants, with the result that nearly half were red and half white. One most noticeable point about vegetables was the fact that so little improvement had been made in them during the last 50 years; nearly all the common sorts had remained the same, or nearly so, and one could not say the new varieties were an improvement on the old, with the exception, perhaps, of onions, and even then it was a question whether the new varieties were as good as the old brown and white Spanish. The Egyptian beet, or turnip-rooted beet, had driven the long-rooted variety out of the market, but he did not think they were of such good quality. Chemical manures had much to do with the vegetable growing, but in the use of most of them a good deal of care should be taken, otherwise the soil would be impoverished. The constituents required by plants were chiefly nitrates, phosphates, sulphates, magnesium, iron, and lime, and under constant cropping some of those were liable to become exhausted. Vegetables were gross feeders, and one should therefore keep the land well supplied. The best way to do that was by a proper rotation of crops, and by an application of good farmyard manure, which was made up as follows:—Horse and cow droppings mixed with the urine of horses, the cleanings of pig styes and fowl pens, and, if procurable, sheep droppings, well mixed and left to stand for several months, but not allowed to get too hot, otherwise the ammonia would be lost. The manure would be greatly improved by the addition of bonedust and blood manure; but where a manure, as above cannot be had, the next best, in his estimation, was blood manure, and then guano and bonedust. All three of those could be used to great advantage with any other manure. They did not break down the soil too fast and exhaust the lime, which should always be present in all fertile soil. Cultivation was just as important to secure success, and that should be done with care and with a knowledge of the root system of the plants. It was best to use a pronged hoe. In first preparing soil for any plants, it should be dug two spades deep, and the bottom spade should not be put on the top, but mixed with the other, with a view of obtaining an even soil to a depth of from 1½ft. to 2ft. deep. The old system of digging, although slow, was perhaps the best in dealing with weeds; that was to open out the ground and then skim off the surface to a depth of 3in. or 4in. and throw in the bottom, and turn the soil over, thus burying the weeds with their seeds 6in. or 7in. under the surface of the soil.

CLARENDON (Average annual rainfall, 33.67in.).

April 29th.—Present: 16 members.

THE WOOL CLIP.—The question of keeping sheep on the farm, whether of a small or large area, said Mr. P. J. Hawke in a paper on the subject of "The Wool Clip," was one to which every farmer should give more consideration. The average farmer's flock very often contained a percentage of Crossbred sheep. In classing the wool clip those fleeces should be placed in a bale by themselves. When the sheep had been shorn the fleece should be carefully picked up and placed on the wool table. The skirting of the fleeces if not done properly would lower the price of the wool. To fold the wool the hind portion should be turned back to the middle of the fleece, and the edges folded in. That would bring the shoulder of the fleece on the outside, which was generally of a bright nature. Wool that had been carefully pressed generally had a nice appearance when opened for inspection by the buyers. The skirtings from a small flock could be baled in one lot, with the exception of the stained pieces from the crutch of the ewes and the bellies of the

wethers. In sorting the fleeces the following classes should be observed:—Lightest and brightest fleeces, class AA; and heavier and stronger wool classed as A; fatty and discolored wool as B. The bellies should be placed in a bag by themselves. The locks and floor pieces could also be placed in one lot. By classing the wool the farmer enabled the purchasers to form a good idea of the clip, and better prices would be realized. Mr. J. Spencer tabled two samples of long red mangolds, one grown on stiff clay, the other on good soil; both were limed well to kill the slugs. The one grown on the clay was twice the size of the other. Mr. Phelps gave the meeting an account of his trip to Port Broughton, and tabled several samples of shell grit taken from the beach. One of special interest was taken from the bottom of a hole 7ft. deep, which was first-class shell grit. He also tabled samples of raw and washed fibre, and gave the meeting a very interesting account of the manufacture of same.

HARTLEY (Average annual rainfall, 15in. to 16in.).

May 22nd.—Present: 11 members and one visitor.

Mr. F. Pope contributed a paper on the question of "Destroying Weeds and Rubbish on the Farm." The speaker pointed out the necessity for cultivating the land, and also the benefits that would be derived from the keeping of sheep on the farm. The paper was discussed at length, and several questions were answered.

INMAN VALLEY (Average annual rainfall, 26in. to 27in.).

May 23rd.—Present: 10 members and two visitors.

RABBIT DESTRUCTION.—Mr. J. Millard read a paper dealing with this question. The best method of destroying rabbits, he said, was by the use of poison during the summer months of the year. On small holdings he did not think it necessary to go to the expense of purchasing a poison cart. On land where it was not convenient to use a plough the baits could be dropped around the burrows. During the burning season he advised members to burn all bushes, ferns, briars, gorse, &c., because they provided a good harbor for the animals. At the commencement of the winter months he strongly advocated the use of traps. Not only would the sale of the skins amount to something, but the breeding of the rabbits would be reduced considerably. An occasional day out with the gun would account for many rabbits that might evade the traps.

KANMANTOO (Average annual rainfall, 17.90in.).

May 18th.—Present: nine members.

FALLOWING.—In the course of a paper on this topic Mr. L. J. Wooley said:—"Wheat-growing is uncertain in some districts, because no attempt is made to conserve the water that falls prior to planting. Modern methods require and enable this to be done, and when they become general, failure in our present wheat districts will be almost unknown. The industry will then be less speculative, and it will be placed on a sounder and more prosperous basis than ever; the average yield will be largely increased, and a larger area will be brought under cultivation. The practice of fallowing consists of ploughing the land a year previous to sowing the crop, and allowing it to rest during the interval. In years past the practice was to plough as deep as possible, but with more experience to guide us, it is found that very seldom is more than 5in. or 6in. necessary, and the best results are usually obtained from a depth ranging from 4in. to 5in. Farmers should be careful not to plough too many years at the same depth, however, as such a procedure is very liable to result in a hard pan forming. If the ploughing has been 5in. on, say, two occasions, it will be found best to plough the third time to 4½in., the fourth time to 4in., and then to come back to 5in. at the fifth ploughing. As the essence of fallowing is the storage in the soil of moisture precipitated before the seed is sown, so that it may supplement that which falls during the growth of the plant, [illegible] should be put in must be governed largely

by the incidence of the rainfall. In our district the greater part of the year's rain falls in the winter, and operations must be directed at carrying the rainfall of one winter through the following summer in order that it may be available in the soil in the autumn, therefore the farmer who fallows should plough in July and August. The ploughed land should lie in the comb for six or seven weeks after ploughing, and then be broken down with heavy harrows. This method is usually preferable to breaking the comb down immediately after ploughing, because the winter rains in the former case are more likely to be absorbed—air, wind, and sunshine are better able to penetrate and sweeten the soil, and the particles of the soil are not likely to run together and form a hard crust as easily as they would if the land were harrowed immediately after ploughing. As the principal object of fallowing is the storage of moisture, to the end that two years' rainfall may be used to produce one crop, it will be easily recognised that the subsequent working of the fallow has a very important place in this method of cultivation. It may be said that only a small percentage of the fallowed land in the State is worked as it should be. It is true that the wise practice of ploughing in the winter or spring preceding sowing is becoming more general, but it is seldom that the soil is given the attention during the summer that it should have, and the wonder is that a lot of the fallowed land yields as well as it does. Weeds are allowed to spring up, and are not checked; the surface is allowed to become crusted, and is not disturbed, and in this way the value of much of the work that has been done is seriously discounted. The objection urged by many farmers is that summer cultivation involves work at the hottest season of the year, and at a time when the horses are fully entitled to a spell, but the evidence in favor of the method is so strong, and the advantages so great that no wheat farmer can afford to neglect it without first having counted the cost. Professor Watt made the remark some time ago that even though the area of land fallowed might not have increased very much in the preceding two or three years, a very definite change had taken place in the attitude towards fallowing. Farmers have always known that it increases the yield, but the difference is that to-day they recognise that it saves moisture. That in itself is a very important achievement, especially in a country where every drop of stored moisture has an influence on the eventual results, but surface cultivation to prevent evaporation has the closest possible association with the earlier working, the prevention of crusty and weedy surfaces is absolutely essential if fallowing is to be truly and thoroughly effective. It is well enough known that, while the top 12in. or 18in. of the soil are the most important to plant life, beneath that is stored water which is conducted by fine capillary tubes to the surface, where it is lost by evaporation. If these minute tubes become established they will continue to carry off the moisture as long as there is any below, and the only way to prevent that from taking place is to disturb the surface and break the capillary tubes, thus locking the moisture in. The effect of neglecting the fallow, as results clearly show, is to allow the moisture which has been caught to escape again into the air. The only way to prevent that is to maintain a loose surface, and thus put a lid on the reservoir. There is another reason. A neglected fallow means a dirty fallow, to which weeds add their part to the loss of moisture and plant food, and spread their seeds to the detriment of the land next season. As the object of working the fallow is to produce a loose mulch on the surface, in order to prevent the evaporation of the soil moisture, it can be easily understood that the fallow should be worked in such a way as not only to produce, but to preserve this loose mulch. Provided the soil has been ploughed when in good condition, it can with advantage be left in the rough state as broken by the plough, there being no necessity for immediate further treatment. But if the ground has been ploughed when wet enough for the furrow to show a polished surface, it will be desirable in most cases to harrow it as soon as it is dry enough to crumble perfectly, otherwise it is liable to become so hard and lumpy that the labor necessary to make a good seed bed will be largely increased. The object of working the fallow early in the season is to keep a mulch on the surface, so as to conserve the moisture in the soil beneath. Mulches act by breaking the connection between the surface soil and that beneath it. The more thorough this connection between the two sections the more effective will the mulch be. The plough, by cutting off a layer of surface soil and returning it loosely, completely breaks the connection between the two sections, and in consequence makes a more effective mulch than any other implement. Recently ploughed land is therefore covered with the

most effective mulch possible. This is especially the case if the residue of a green crop has been turned under. No hard and fast rule can be laid down as to the implement to use for working the fallowed land. The farmer will be guided by the condition of the soil, and will use the implement likely to achieve the result in the cheapest way, mindful that the working in the early stages of fallowing is to conserve the moisture rather than to prepare a seed bed. No effort should, at this time, be made to reduce the surface to a fine tilth, for coarse mulches remain effective longer than fine ones. Before the ground gets very firm, and if free from weeds, the harrows can be used cheaply and with advantage. If the ground is set a cultivator should be used, and if weedy a skim plough, but again no definite rule can be laid down as to which implement should be used in working the fallow. The farmer must follow his own judgment, according to the condition of the soil. As the result of the working which the land has received whilst being fallowed, its condition at the time for the reception of the seed should be ideal, especially if the final cultivation just before seed time has been with the skim plough to ensure that any young weed growth likely to interfere with the welfare of the wheat has been effectively destroyed. As the result of such treatment the seed bed will be clean, in good tilth, with the soil immediately below the surface in that compact condition which induces constant capillarity and admits of the free upward flow of the soil water from the subsoil, thus providing conditions favorable for ready germination and vigorous growth. Deep reploughing just before seeding is not recommended; it is likely to prove injurious by making the seed bed too open and dry for the requirements of the wheat plant, and also by bringing deep-lying and dormant weed seeds to the surface where they will have the same opportunities as the wheat to grow and compete with it for existence. In the case of non-fallowed land there is always a possibility of almost total failure to be reckoned with, while in the case of fallowed land there is always a reasonable certainty of success. It is evident that, apart from any other advantages gained by fallowing, such as the maintenance of fertility, the checking of wild oats, &c., a rigid system of fallowing should commend itself on a simple commercial basis to every wheat farmer in the State."

KANMANTOO (Average annual rainfall, 17.90in.).

June 22nd.—Present: seven members.

ANNUAL MEETING.—The Hon. Secretary (Mr. C. J. Downing) read the annual report, and the election of officers for the coming year followed.

MACGILLIVRAY.

May 22nd.—Present: six members.

THE AGRICULTURAL BUREAU.—In a paper under the heading of "Some of the Benefits to be Derived from being a Member of the Agricultural Bureau," Mr. H. J. Wiadrowski said, in a district such as theirs, where the population was small, the benefits of the Bureau were not so great as those of more settled areas; but if all the settlers in the district were to become members, the benefits would be considerably increased. Foremost among the advantags of being a member of the Bureau was that of obtaining advice from the expert officers of the Department of Agriculture on all matters relating to farming and the raising of stock. The Bureau enabled the farmers in each district to meet together and discuss those questions of agriculture particularly applicable to their district. The reading of papers on matters relating to farming was also important, and although members might not agree with points expressed by the writer of such a paper, the discussion arising therefrom was of an educational character.—Mr. A. J. Nicholls exhibited the carcass of a fat sheep weighing 70lbs.

MEADOWS (Average annual rainfall, 35.52in.).

June 19th.—Present: seven members.

QUESTION BOX.—The meeting took the form of a question box evening, when number of questions of local interest were discussed by the members.

CYGNET RIVER, June 20th.—The meeting took the form of a discussion on a question of "Sand in Horses."

LONGWOOD, May 25th.—The monthly meeting of the Branch was held at Mr. J. R. Coles's residence, when matters of local interest were discussed. Members also inspected the lucerne patch and orchard.

MEADOWS, May 22nd.—Mr. S. Smith read an extract from a paper on "Apple Culture," and a lengthy discussion followed.

MORPHETT VALE, May 25th.—The meeting discussed the need for better trucking facilities at the local railway station, and various items dealing with stock troubles.

PORT ELLIOT, May 18th.—Mr. C. H. Beaumont (Orchard Instructor) addressed the meeting on the question of "Planting Fruit Trees." The meeting also discussed the questions of "The Quality of Supers." and "The Evaporation of Dried Fruit."

STRATHALBYN, May 28th.—Mr. Jos. Saunders contributed a paper on "The Breeding of Pedigreed Livestock."

SOUTH-EAST DISTRICT.

COONAWARRA.

May 30th.—Present: 15 members and two visitors.

THE CARBENET VINE.—Mr. V. Pounsett, in a short paper on this subject, said the Carbenet vine was a very poor bearer, and gave only small results in that district. Acting on a suggestion from Professor Perkins, they had grafted Grenache on to the Carbenet with excellent results. The Carbenet was a hard vine to graft, because the frost cut back the only eye above the ground; but it was often found that they would shoot again from a lower bud. The stem should be cut or grafted as low as possible, but care should be taken to see that a straight piece was left, in order that it would split easily. Those buds that were not affected by the frosts very rarely sent out suckers, but the old root lived for two or three years, and could be grafted again by making a fresh incision or deepening the old cut. The scion should be cut in the shape of a wedge, with the inside of the cut slightly smaller than the outside, thus allowing the bark on the vine to pinch the graft firmly. No strings would be required, excepting for very small, weak vines, and the earth should be filled in right above the top bud, if possible, thereby protecting the buds from the frost. September was the best month during which grafting should be done. He intended to try the Doradilla on the Carbenet during this season, and he would be pleased to report, at a later date, to the Bureau, the result of the experiment.

PHYSICKING VERSUS DRENCHING IN THE TREATMENT OF HORSES.—This subject was dealt with by Mr. J. Clayfield, in the following paper:—"It is often found, in the treatment of stock, that a purgative is necessary, and there are various medicines which can be used for this purpose, the most common of which are salts, oil, and aloes. A horse requires from 8oz. to 16oz. of salts, to which must be added ground ginger or some other ingredient to prevent griping; and this, when mixed with the necessary amount of water (about 1 quart), makes a very bulky dose, that is difficult and dangerous to administer. The same may be said of raw linseed oil, which is generally used, the dose of which is about 1pt. to 1½pts. As a rule horses will not take it kindly, and many fight against it, so that often some of the dose is lost; and then one does not know how much they have had. There is also the risk of getting a drench into the lungs, which is certain death. Aloes can be given in the form of a ball, which, if properly prepared, contains not only the purging elements, but in it is blended other drugs to prevent griping, and the mass is coated with gelatine to preserve it indefinitely, and yet dissolve quickly as soon as the animal receives it. It is easily seen that, as a purgative, the aloetic or physic ball is by far the best, and one is sure of the exact dose, and also of the action, if the horse is prepared before-hand with two or three bran mashes. There is practically no danger in giving them, and many farmers are beginning to use them in preference to oil. If one has a mouth-gag it is a very simple matter to give a ball. Place the gag in the horse's mouth, and open it as for dressing the

teeth. Take the tongue in the left hand, and pull it gently to the outside of the mouth. The ball is then safely placed by the right hand as far back into the mouth as possible; the mouth gag is then quickly closed and removed. Should no mouth-gag be available, take a piece of rubber garden hose-pipe, about 2ft. long; put the ball in one end, and have a piece of stick to go inside the rubber pipe to push the ball out. Get someone to open the horse's mouth by holding the tongue, and then stand in front and push the tube right into the mouth and shoot the ball in. Physic balls have been used for treating worms, in conjunction with a good worm powder given in food. The best day to give a ball to working horses is on Saturday, as the horses can rest on the Sunday while the medicine is acting, and on Monday they are ready to work again, but should be used gently for a few days. While the ball is acting, the chill should be taken off the drinking water, especially in cold weather, and the horses not allowed to drink in large quantities. In treating cases of colic it is advisable to first give a colic drench, and follow it immediately with a physic ball. The colic drench may be repeated every four hours afterwards until the pain is subdued. The size of the physic ball varies from 3 drams to 8 drams, but the sizes most in use are 4 drams, 6 drams, and 8 drams. The 4 drams are for ponies, yearling thoroughbreds, and weakly yearling draughts; 6 drams for buggy horses and light to medium draughts; 8 drams for heavy draughts in good condition. When horses are weak, as at the present time, it is better to use one of the smaller sized balls.

KONGORONG.

May 21st.—Present: eight members and two visitors.

DESTRUCTION OF FOXES.—The most suitable time at which to destroy foxes, said Mr. E. Asbey in a paper under the heading of "Destruction of Foxes," was when they were a few weeks old. Old wombat holes or small caves were generally used for breeding places, and one could easily tell if there was a nest of young foxes inside, because the ground outside would be quite bare. If a rabbit trap was set at the hole, practically every young fox would be caught. March and April were the best months during which to poison the older foxes, because there was not a great deal of food about for them. Rabbit liver, birds, and lard or dripping could be used as baits. He had obtained the best results by mixing the poison with the blood of any beast that had been killed for household purposes. From May to August it was necessary to go to a little more trouble, as the foxes would not take the baits so readily. Very young rabbit baits would often be taken by the fox. The baits should be lightly covered with earth, otherwise the crows would get them. The correct amount of poison to use on a bait was just about as much as would cover the point of the blade of an ordinary pocket-knife.

MILLICENT (Average annual rainfall, 29.25in.).

June 1st.—Present: 11 members.

FERN ERADICATION.—Mr. Holzgrefe, in opening a discussion on this question, said he had had considerable experience in the eradication of fern. He cited several cases where land had been made fertile by constant cultivation and by the planting of different varieties of grasses. Mr. Mullins mentioned that 12 varieties were tested on the experimental block, and black prairie had proved the most beneficial. Mr. Bowering said the grass best suited to sandy land was *Trefolium subterrancum*. Mr. Hart related his experience in dealing with a piece of pure white sand, from 2ft. to 4ft. deep, and covered with a dense crop of ferns. By continual cultivation and sowing crops of rye and other green feed, and also peas and mangolds, he had succeeded in completely destroying the ferns. He indorsed all that Mr. Holzgrefe had said, and remarked that through the aid of artificial manures the farmer of to-day had an advantage over the early settler. Mr. Mullins said basic slag had given the best results on his land. Mr. Crisp had cut a lot of feed from the good land on his farm, and intended feeding it to stock during the winter by distributing it where ferns were growing. Sandy land, when cultivated, seemed to be a hot

bed immediately after the autumn rains, and the rapid growth of any suitable crop sown on it was very noticeable. The more it was ploughed the better; but unless a crop was sown it was only transplanting the ferns. He described an implement of his own make that had proved an excellent fern destroyer. He was satisfied that by continuous ploughing ferns could be destroyed. He favored the mould board plough with a wide share in preference to a disc. Messrs. Major and Serle considered a disc the most suitable implement. The former stated that he had had some experience in ploughing light land and ferns. A paddock which had been broken up for the first time during the winter with a disc plough was allowed to lie till the following autumn, when it was again turned over, and oats and grass seed were sown with good results. Since then the land had been cross ploughed and good crops of oats harvested. Mr. Day said that Mr. Major's experience supported his contention that sandy land required fallowing at the outset.

MUNDALLA.

May 22nd.—Present: nine members.

TRAINING SHEEP DOGS.—Mr. J. Saxon, in a short paper on this question, said two of the main factors in the successful training of sheep dogs were the breed of the dog and the patience of the man training the animal. In selecting the dog, he preferred one bred from a strain of good working dogs. Training should commence when the pup was about three months old, and he should first of all be taught to obey such commands as "Sit down!" and "Come to heel!" If the dog was taught at that age he would be much quicker in obeying the voice, and one would always have him under control. The best plan was, of course, to give the young dog a lead with a more experienced animal, but if that was not possible, the trainer should allow the younger dog a considerable amount of latitude, and not be unreasonably harsh with him. When he made a mistake he should be brought to heel and made to try again. Very often people when training dogs for working sheep made the great mistake of thrashing the dogs. If that were done the animal would loose heart and would never make a good worker. If one considered that the dog they were training showed sufficient progress, he should first of all be taught to drive a small flock of sheep through a gateway. On no account should the dog be forced on to the sheep, as that tended to make the dog a noisy worker, and that was a very bad point in show work. Another point to be remembered was that the dog should not be allowed to pass between his trainer and the sheep. After he had become accustomed to taking the sheep through a gate and into the yard, the hurdles could be erected in any clear space, and the dog given seven or eight sheep to work. One should not expect the dog to yard the sheep on every occasion, but as he became more used to the work, the number of sheep could be reduced. If the dog was at all intelligent, progress would soon be made. In conclusion, the speaker again pointed out to the members the absolute necessity for kindness and patience.

NARACOORTE (Average annual rainfall, 22.60in.).

May 10th.—Present: 19 members.

FORMING AND STOCKING A MIXED GARDEN.—In a paper on this question, Mr. A. Johnstone said in choosing the site for the garden, it was desirable that the ground should either be level or have a gentle slope to the north, north-east, or north-west. If the ground was sloping, drainage could easily be effected, but if level, care should be taken to see that that level was not so low as to prevent drainage. If the chosen ground lay in a depression, a slope to the north-east would be the better position, in order that it would receive the morning sun. After the house had been erected on the most healthy position of the farm, the next thing to do was to erect a fence. The shape of the garden might be either square or rectangular, with paths 3ft. or 4ft. wide, one running east and west, the other north and south. Another walk should be made 60ft. from the fence, and 10ft. from the outside edge of that walk; he would then plant fruit trees 20ft. apart all around the ground, keeping the stone fruits on the higher positions, and the apples, pears, &c., on the lower. He would also plant almond trees along the fence to form a breakwind. Four of the principal

requirements in the cultivation of vegetables were as follows:—Good deep cultivation of the soil, no tree roots to rob the plants of their nutriment, good shade, and plenty of farmyard manure. Before putting the crop in, the ground should be trenched and the bottom soil thoroughly broken up. If one wished for a good supply of vegetables all the year round, plenty of water was indispensable. It was a good plan to give the ground a thorough soaking periodically, and it was here that one would observe the need for a good system of drainage. He would then form borders 4ft. wide along the borders of the inner walks, and plant them with herbs, gooseberry bushes, and a general collection of flowering plants. The vegetable seeds could also be raised in those plots. The two top sections could be planted one year with root vegetables, such as onions, carrots, parsnips, potatoes, &c., and the other plot sown with cabbages, cauliflowers, peas, &c., each plot being planted with a root crop alternately. One of the bottom two plots could be planted with vines, strawberries, and celery; the other with tomatoes, asparagus, and plants of the cucumber family. In planting asparagus, the bed should be from 3ft. to 5ft. in width, and the soil removed to a depth of 3ft.; 12in. of fresh stable manure should be placed in the bottom of the hole, and the soil then replaced after mixing with it a fair quantity of decayed stable manure and a little salt. Rhubarb should also have a rich bed prepared for it. The soil most suitable for a garden would be a good sandy loam mixed with humus. Gardening operations should be commenced towards the end of February, when carrots, cabbages, cauliflowers, and onions could be sown. At about that time trees and plants could be ordered from the nursery, and the whole of the ground work of the garden proceeded with. All the rows should be laid out in a north and south direction, because they would then receive the benefit of the sun, and the possibility of one row drawing on the vitality of the others would be overcome.

TANTANOOLA, May 4th.—Mr. T. Kiely addressed the meeting on the question of "Sheep-breeding," and favored the Lincoln-Merino cross and the class of sheep best suited for that district.

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